AMERICAN FRUIT GROWER

Vol. XL
No. 2

February 1920

Ten Cents
A Copy

Edited by Samuel Adams

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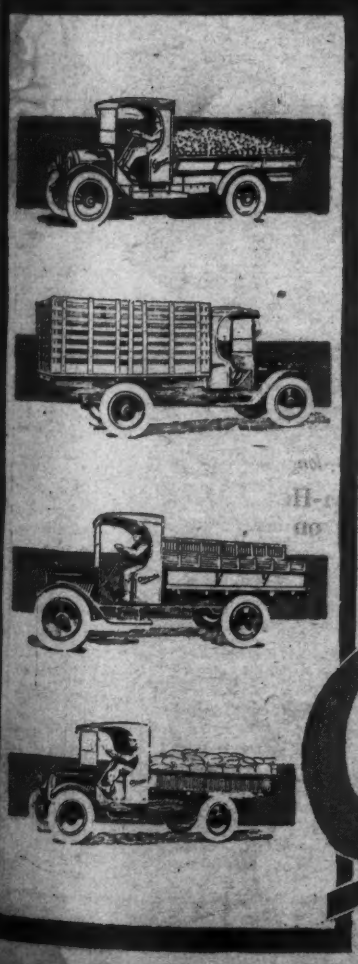

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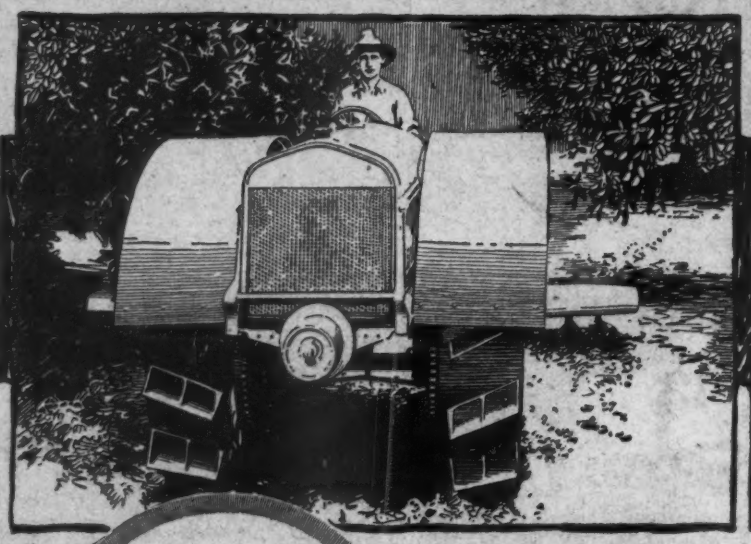

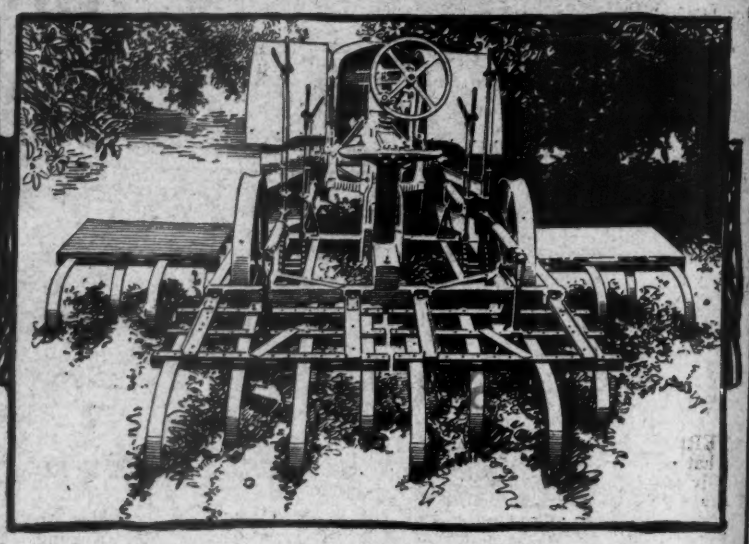

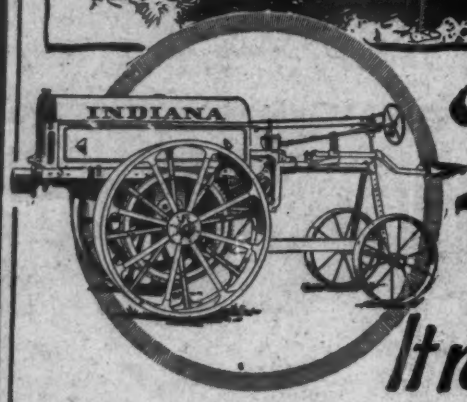

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AMERICAN FRUIT GROWER

The National Fruit Journal of America

PUBLISHED MONTHLY BY
AMERICAN FRUIT GROWER COMPANY, Inc., State-Lake Bldg., Chicago, Ill.

Entered as second-class matter Oct. 17, 1917, at the Post Office at Chicago, Ill., under the Act of March 3, 1879

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Vol. XL FEBRUARY, 1920 No. 2

Lessons of the Georgia 1919 Peach Crop

By T. H. McHatton, University of Georgia

THERE is never a crop season that in some way does not advance the industry. Failure, spelled with capital letters, generally leads to success later on. Take for example the Georgia crop of 1908. That year saw the production of eight thousand cars of peaches; up to that time, the largest crop in the history of the state. This crop, coupled with no organization and poor distribution caused serious losses to the growers; it was followed by the elimination of the careless producer and the formation of the Georgia Fruit Exchange.

This organization came into the field in 1909. It rapidly got control of the marketing of the greater portion of the crop and at the beginning of 1919 had profitably and successfully handled seven successive peach crops. During 1918 it marketed over eight thousand carloads at record prices. The profits to the growers were enormous, many of the orchards netting the owners from five to ten per cent on a $1,000 valuation per acre. Such was the condition at the beginning of the season of 1919.

With plenty of money in hand with which to handle their plantings, the growers sent their orchards into the winter of 1918–1919 in fine condition. Prospects were excellent for a large crop: these prospects were partially blighted by a heavy freeze in the early spring. In the northern part of the state, in localities where hundreds of cars were expected, practically everything was killed. In the central sections and around Fort Valley some varieties were cut as much as fifty per cent. As soon as possible the Georgia Fruit Exchange gave out its estimates of the crop, the total being something about seven thousand cars, distributed among varieties about as follows: Early varieties as Mayflower, Arp Beauty, Uneeda, etc.—1,000 cars—Carman '600, Hiley 1,300, Belle 1,500, and Elberta 2,600.

Early Conditions Excellent

The loss was not as much as had been anticipated, due to the facts that a large number of young trees were coming into bearing and the freeze injury had not been so severe in the heavy producing districts.

A visit to Fort Valley just as the harvesting of the early varieties was opening up showed the orchards in excellent condition and the fruit in fine shape. Early f. o. b. buying and the purchase of the fruit delivered at the packing houses were strong: there was every indication that the prices of 1918 would be duplicated and it was expected that they would be bettered. The peach growing fraternity of Georgia was in excellent spirits; as slangily expressed, "The goose was hanging high."

To understand conditions as they finally developed, a rather close analysis of the past peach season is essential. Due to the large prices that have been received for very early fruit, large plantings of such varieties as Mayflower, Uneeda and Arp Beauty have been made during the past years. The 1919 season was the first one in which heavy shipments of these early varieties took place. The Georgia Fruit Exchange's estimates of early varieties was 1,000 cars. This estimate was exceeded by 600; and as is generally the case, these early fruits were small and in no way had the quality the market expects of a Georgia peach.

The contractors were paying sixty-five to seventy cents per five-eighths bushel basket for these varieties delivered at the packing house. It took two or more of these baskets to pack a six-basket crate, for as the season progressed the culls increased and the carrying qualities became poorer, due to wet weather and curculio. The prices on the markets therefore rapidly fell; also the early crop from the north central sections of the state was coming into competition with later and better varieties from the south.

The buyers or speculators who had contracted the greater portion of the crop f. o. b., or delivered at the packing house were still having to pay the contract price, but were losing money. The large quantity of early fruit made a bad impression on the markets, which could have only been overcome by excellent fruit of later sorts. This good fruit of well-known varieties could not be obtained this season, due to conditions absolutely beyond the control of mere man.

The Carman, which is really the first good, fairly early peach of the state and the one with which the season usually opens in quantity, has not a very enviable reputation for carrying qualities at the best. This year the rains further lowered its carrying proclivities and it could in no way overcome a market already injured by poorer fruit. The contract price paid for this variety was around seventy cents per five-eighths bushel basket, delivered at packing house; again the contractors and f. o. b. buyers came out at the little end of the market horn. The exchange's estimates on this variety were 600 cars in the Fort Valley section. More cars than this were shipped; another underestimate which did not help out market conditions.

Interior of a Large Packing House in the Fort Valley District.

The Hiley follows the Carman, and is one of the most esteemed varieties grown in Georgia. It is well worthy of its reputation as a market sort, being considered by many as the first really good peach that is shipped from the state. It has earned its popularity on the northern markets and has many admirers among its consumers.

The packing house price was seventy-five cents per five-eighths bushel basket; the estimates of the crop of this variety were 1,300 cars. Of Carmans and Hileys the total estimates were 1,900 cars. The section shipped 2,100 of both varieties together. The Hiley suffered from rain this year, as well as from curculio and did not carry, consequently the prices on the markets were not in proportion to those paid at the packing house or on the car.

Belles of Poor Quality

The Belle just precedes the Elberta and fills in the gap between that variety and the Hiley. By the time the Belle reaches the market, the appetite for peaches has been partially satisfied, but its fine appearance and quality make it a good seller. Should the early peaches hurt the market, the Belle is expected to put it on its feet again and stabilize it so it can handle the final peach wave from Georgia, the Elberta.

It was estimated that from Fort Valley there would be 1,800 cars of Belles shipped. In reality, there were 1,700 cars. This was not enough to overcome the influence of the early fruit, nor were the Belles themselves up to standard. Coming at the latter part of the season, they were badly rotted, due to excessive rains. They were also very wormy and went to market in bad shape, consequently the prices received were camparatively low and they did not improve a condition that was already bad.

Small Elberta Crop

The Fort Valley section expected to ship 2600 cars of Elbertas: the total shipment from the section was 1100. This variety came on in a most miserable condition. In some sections it was totally killed out and in others it was greatly reduced by the frost. Being comparatively late in ripening, it was almost impossible to keep it from rotting and the curculio had a most excellent opportunity to make it wormy. Had it been up to standard and in sufficient quantity, it might have been able to establish its own market, but under conditions existing it only served to add fuel to the fire and close Georgia's 1919 peach deal, but not in a blaze of glory as had been expected.

Hotel Buildings and Some of the Harvest Hands in a Large Peach Orchard in Georgia.

Bad Weather Conditions

Weather conditions were at the bottom of most of the trouble experienced during 1919. During a thirty-day period prior to June 4th approximately four and a half inches of rain fell in the peach section on twenty days; from

(*Continued on page 48*)

Fighting Frost In an Oregon Orchard

By Alfred C. Allen, Oregon

THE word "smudging," as applied to the practice of fighting frost in orchards today, is a misnomer. While smudging, in its strictest sense, is still resorted to by some and often proves advantageous in almost any section, yet the practice of smudging to prevent frost injury has been superseded by "orchard heating." This latter method substitutes heat for the smudge and depends upon its success for the actual raising of the temperature by the heat generated.

Smudging is not new. In fact history tells us that it was used about two thousand years ago. Since then it has been used as early as the tenth century in France and later by many different countries. However, like some other branches of art and science, but little improvement was shown until within the past few years.

It is not the intention, in this article, to deal with the various methods and contrivances used in different sections, but only in so far as is practiced in the Rogue River valley, in southern Oregon. Such practices as are described have been proved by experience to be good.

It was not until a few years ago that orchard heating was practiced to any extent in the valley of the Rogue. The writer was one of the first to take the matter up seriously and to attempt to solve the frost situation in a scientific and economical manner. In the present article it is not intended to write a technical treatise, but to explain in the language of a layman how the work can be done to insure success and economy.

Frost in Rogue River Valley

In speaking of the Rogue River valley, it is intended to mean that portion of the valley lying between the Rogue River and the city of Ashland, with Medford as its approximate center. Practically all the operations mentioned took place within a few miles of the latter city. The valley, as mentioned above, is surrounded by lofty mountains and is about 80 miles from the Pacific ocean. The climate is mild in the valley though the snow attains considerable depth on the mountains surrounding it.

The "frost season," as it is generally known, is usually from about the first of April until the tenth of May. The apple and pear trees are then in blossom or have set the tender fruits and are very susceptible to frost injury. At this season of the year it is found that the nights are generally calm and almost invariably, during a frost, it remains so, or there is a slight breeze from the south with some variations from the south-east or south-west.

In speaking of frost the orchardists generally speak of a "frost" or a "freeze." The generally accepted meaning of a "frost" is when a temperature is experienced during clear weather with a minimum not less than 27° or 28°. A "freeze" is considered to be that condition when the temperature falls below 27° or 28°. This usually follows stormy weather, or during a storm, when snow may fall and the temperature drop below the freezing point even beneath cloudy skies. During a normal frost the skies are invariably clear and cloudless, the appearance of the slightest haze, or film of clouds, will cause an immediate rise in temperature above the danger point. The writer has often watched with alarm, the rapid fall of the thermometer on a clear night, and frost seemed inevitable. But, silently out of the west came clouds. First perhaps a few small patches, followed with larger ones, and as soon as they appeared overhead, the thermometer rapidly rose.

April 13th, 1912, was a typical example of this. The writer's record for this day says: "Day cold and disagreeable with snow still low down on the mountains. Rained some during the day." The record further shows that at 7.45 P. M. the temperature was 38° and at 8.30 the sky was clear—a desperate outlook. At 10.20 the temperature was 32° and at 11.45 it was 130½°. Every indication was for a temperature of 25° but about 12.15 A. M. clouds appeared and the temperature went up above freezing and the minimum was 30½°.

Causes of Frosts

The reason for this can be readily seen when the cause of frosts in the valley is understood. It was thought, in the early stages of our frost fighting, that the frosts were caused by the cold air flowing down from the snow banks on the mountains and settling in the valley. This has been, I believe, generally accepted as erroneous and that the true cause is the radiation of the heat from the ground. It is true that air drainage and the location of the orchards has a great deal to do with the matter. Records show that certain low spots in the valley always have a lower temperature than those on higher ground. Those orchards on the mountain sides, considerably above the level of the valley floor, are generally free from danger of frosts, as they are high enough to have ample air drainage.

A frost never occurs during a period of high humidity and this is an important factor in the prediction of frost, as will be shown later. The appearance of clouds means higher humidity and also serves as a blanket preventing the rapid radiation of the heat from the ground. Thus, when clouds appear, the moisture, besides preventing to some degree the radiation, also gives off heat as it cools.

Lighting the Pots.

Early Morning View of Orchard Heaters in an Oregon Orchard.

conditions for a frost are clear skies and low humidity coupled with cool days.

Fuel for Heating Orchards

The most generally used fuel in this district is oil. Great difficulty was at first experienced in this fuel, as crude oil was used. Naturally the cost was a very important factor in determining the kind of fuel to be used and as a result western oils had to be utilized. These oils are all of asphaltum base and, in the imperfect combustion obtained in the pots, a large amount of residue was left unburned. This residue was for the most part asphaltum and was impossible to remove during the frost season, the result being that after a few firings the pots were so filled with this mass that there was room for but little oil. Experiments were carried out by Prof. P. J. O'Gara, who was then Pathologist of Jackson County, and through his efforts and the co-operation of the oil companies a special "smudge oil" was prepared from which most of the asphaltum was removed. Difficulty was experienced with the crude oil in handling as it was hard to get to flow properly when cold. The special oil mentioned is much lighter in body and flows freely under all conditions.

Smudge and Fire

Wood was also used by many and is still used by a few. In some cases manure, sawdust and trash was utilized in order to produce a smudge. In this it was hoped to produce a blanket close to the ground which would have the same effect as clouds. All of the methods were more or less successful but the latter was the least effective. The writer first used the smudge in his orchard, depending on the smoke to produce results, but abandoned it later for wood fires. The wood has the advantage, in this section, of being cleaner and cheaper, but it has too many disadvantages to offset these two points. First of these is the danger of the wood getting wet and so becoming hard to ignite. In the second place it is impossible to know whether your wood fire is going to burn brightly with great heat, or only smoulder. It is equally impossible to determine how long any wood fire will burn. These fires require constant attention to keep them burning, are hard to extinguish after the frost has passed, and it takes a great deal more labor to re-lay the fires than it does to re-fill pots.

With oil we know that a gallon pot will burn for at least three hours, they are easily and surely ignited, burn without further attention and are quickly re-filled from the tank wagons.

Types of Heaters

The types of pots offered for sale and used are varied. Some hold as much as five gallons of oil and are fitted with covers and small chimneys, dampers being arranged in the cover to control the burning. Some types of these oil stoves have proved efficient. They burn the oil more perfectly and with greater heat and less soot than the ordinary open pot. O'Gara made a large number of experiments in 1911 with various types and says: (Bulletin No. 5. The Prevention of Frost Injury in the Orchards of the Rogue River Valley.) "The writer, however, has contended that the simplest type, which, of course, will be the least expensive, is the one which will grow in favor with the fruit growers." This prophecy has been amply fulfilled, for the Fresno, or lard pail type, is still the most generally used and is the simple form referred to by O'Gara.

It is true that this pot is far from being as efficient as is desired but its drawbacks are more than offset by its cheapness and simplicity. It consists of a sheet iron pot the shape of an ordinary lard pail and is fitted with a loose cover which extends well down over the edges. Its cost, in the days before war prices became so prevalent, was 11 cents for the gallon size.

Some of the heaters since offered, and used on a much smaller scale, cost many times that amount. Of course these latter hold more oil and burn with a steady heat, almost to the last drop of oil, while the lard pail type gets less efficient the deeper the oil burns in the pot. The heater must also be handled more carefully than the lard pail and watched closer to regulate the dampers. It will not stand the battering and rough usage too often given the pails when being stored away or being placed in the orchard. It is usual to place from two to four pots of the gallon lard pail to each tree in the orchard, so it can readily be seen that the saving in cost is considerable.

Effect of Oil Not Injurious

The greatest objection to the burning of oil has come from those not "smudging." This is on account of the vast amount of soot which fills the air, paints the white dogs and chickens black, adds a shade or two of darkness to lace curtains and generally smirches the landscape. Many contended that it injured plants and spoiled more fruit than it saved. Also it was contended that some injurious gases were given off which killed vegetation generally. In order to satisfy ourselves, the writer, in collaboration with Mr. C. [illegible] Cate, the present Pathologist of Jackson County, secured the co-operation of a large orchard and for three successive seasons heavily smudged a certain block of bearing trees every night during the frost season.

This meant that a gallon of oil per tree was burned every night for from four to six weeks each year, making a total of from 28 to 42 gallons of oil per tree per year. These trees were coated with soot and long streamers of it hung in festoons from them. After three successive seasons the trees are as healthy and vigorous as ever and each year they have set and matured a full crop of fine fruit, as good or better than the trees surrounding it. This seems

(Continued on page 44)

Pruning Native Grapes

By S. J. Bole, Illinois

High Trunk, Trained to a Single Stake. Renewed From Spurs.

WHILE the pruning and training of grapes are two distinct operations, they cannot well be separated. One cannot prune grapes intelligently unless he knows the style of trellis on which the vines will be trained. On the other hand, the kind of trellis and method of training are somewhat dependent on the method of pruning. Correctly speaking, there is but one method of pruning, the renewal method. The various heights at which these renewals are made, requires an arbor or tree as one extreme, while at the other, the vines are left to run over the ground.

From the standpoint of practice, pruning and training are the most neglected and difficult operations in grape growing. Many vines in the home garden are either badly pruned or neglected altogether. The fact that so many different methods of training are in use is reason enough for the beginner to be confused about the correct way to prune and train. If one understands the principles involved successful results are not hard to obtain. As in the pruning of any other woody plant, the pruning and training of grapes may be learned far more rapidly by doing the actual work than in reading about it.

Fruiting Habit of the Grape

The buds of the grape, like those of the apple and peach develop in the axils of the leaves during the summer, autumn and winter. After the leaves drop in the fall, these become the winter buds, which upon the return of warmer weather in the spring, grow into shoots from a few to many feet in length. From one to five clusters are borne near the base of many of these shoots. The average number of clusters per shoot for most vines is about three, and they always are quite near the unpruned one-year wood. Wood older than one year does not bear fruit, and only enough of it is left on the vine to properly locate sufficient of the bearing wood on the trellis.

The number of clusters of fruit which a vine can mature, and not reduce the size and quality depends on the age, size and vigor of the vine; the soil conditions, cultivation and variety of the grape. Strong growing varieties should have more fruiting wood left than the weaker growing kinds. But what ever the style of training, one cannot leave the same amount of bearing wood on each cane but should leave sufficient wood to secure a balance between root and vine. If the vine grows too vigorously, more fruiting wood should be left; if too weak, less fruiting wood is needed.

Vigorous growing varieties are much more satisfactory to train or prune. Concord does not fail in this respect, as seven-eighths of the bearing wood may be removed and still allow fifty or more clusters to the vine.

Age of Wood and Quality of Fruit

An old grape vine, having a large trunk, will produce a large quanitty of fairly good grapes. Somewhat larger and better grapes however, are produced on young canes. Whenever the canes or trunks are left beyond one year, it is not for the size or quality of the fruit; but to aid in training the vine. In any of the several forms of the Kniffen system of training, the trunk is allowed to grow for several years without renewal at the ground. The trunk thus serves to locate the bearing canes so that they can be tied to the trellis wires.

As the quality of the fruit is somewhat influenced by the age of the fruiting cane that is left, a common mistake is that of selecting the largest cane for fruiting, where smaller canes would give better results. A cane the size of a lead pencil will produce better fruit than canes much smaller or larger. The internodes on such canes are short, and the buds round, plump and vigorous.

When a vigorous growing variety is grown on strong soils the shoots usually develop laterals the same summer. This requires the laterals to be cut back to only a few buds each. These "bull" canes are not so good as smaller ones which have more vigorous buds. And as the basal one or two buds on one-year wood is quite apt to produce a shoot without fruit, it is better to have four to six canes with six or seven buds each than to have twelve or fifteen spurs with only two or three buds each. A vineyard which produces excessive wood growth should have more fruiting wood to produce a balance between roots and tops.

Theoretically, the vineyard may be pruned at any time during the dormant season. There are practical reasons however, why the pruning should be done at certain more or less definite times. In the latitude of Pennsylvania, Ohio and Illinois, it is best to prune during the month of February. This is early enough to prevent the bleeding and late enough to avoid any winter killing. In some localities double pruning is practiced. The vines are cut back somewhat severely in fall, with the main part of the pruning done in February. The fall pruning causes the buds that remain to develop better during the winter.

If the vines have to be laid down for winter protection the pruning is done wholly or in part just before the ground freezes. The vines then are bent down and soil thrown over them to protect from winter injury. They are taken up in the spring, pruned in the proper way and again tied to the stake or trellis.

The early vineyardists in America used stakes, and they are still much used in the south. In hilly regions and along river banks, staking always is necessary. Where vines are grown to stakes, one stake usually is driven at each vine, and the canes tied to it. For such purposes, the stakes must be about seven feet long, and driven in the ground eighteen inches or two feet.

The main object in the use of stakes is that it permits cultivation in two directions, but as the foliage develops in a dense mass, the clusters of fruit frequently are misshapen in growing, or broken by the pickers.

Some form of the wire trellis is rapidly replacing the stakes in vineyards. They support the vines better, the fruit is more perfect, of better color and quality, and the amount of it can be controlled better.

If the vines are set eight feet apart in the row, the end post should be four feet from the first vine, and the next post equally distant from the second and third, or the third and fourth vine, thus making the posts stand sixteen or twenty-four feet apart. The right distance depends on the kind of soil, size of posts and wire, and the amount of wind. Vines planted eight by nine feet require 330 posts to the acre.

Use Strong End Posts

As most of the strain comes on the end posts, these should be of extra size, well set and properly braced. One or two cross pieces are sometimes nailed near the lower end of the post and a layer of stone piled around and over it to prevent the post from being "heaved" out of the ground by freezing and thawing in winter. The top of the post is braced by a strong timber extending from the top of the outside post to the ground near the first vine where it is secured to a supporting post, the top of which frequently is glued to the base of the end post with twisted wire.

The trellis wires usually are run through a hole bored through the end posts, and are stapled to the intermediate posts of the row. Where two wires are used, the first usually is placed at two and one-half feet from the ground and the second at five feet. When three wires are used, the top and bottom wires are spaced as before, with the middle wire at three and one-half feet from the ground.

There are three common styles or systems of training grapes, according to the manner in which the fruiting canes are distributed over the trellis. These systems may roughly be designated as the horizontal, upright and drooping systems.

The horizontal method is especially adapted to weak growing varieties. The trellis consists of twowires three feet

Stake Method of Training, with Low Renewal.

apart, the lower wire being two feet from the ground. At each vine a slender stake is driven to which one or more fruiting canes long enough at least to reach the first wire are then tied. The growth which results from these canes is trained horizontally.

The canes are renewed at the surface of the ground, and for renewal one or more young canes are allowed to grow without producing fruit for the next year's fruiting wood. These are trained along the lower wire the first summer, and take the place of the older wood the next season.

In the fan method of training, the canes are renewed near the ground each year and the young canes trained in a fan shape to the trellis. Suckers and buds below the lower wire are removed, except where spurs have been left to form the fruiting wood for the next season. These canes are trained upward as they increase in length during the summer.

Training to Single Stakes

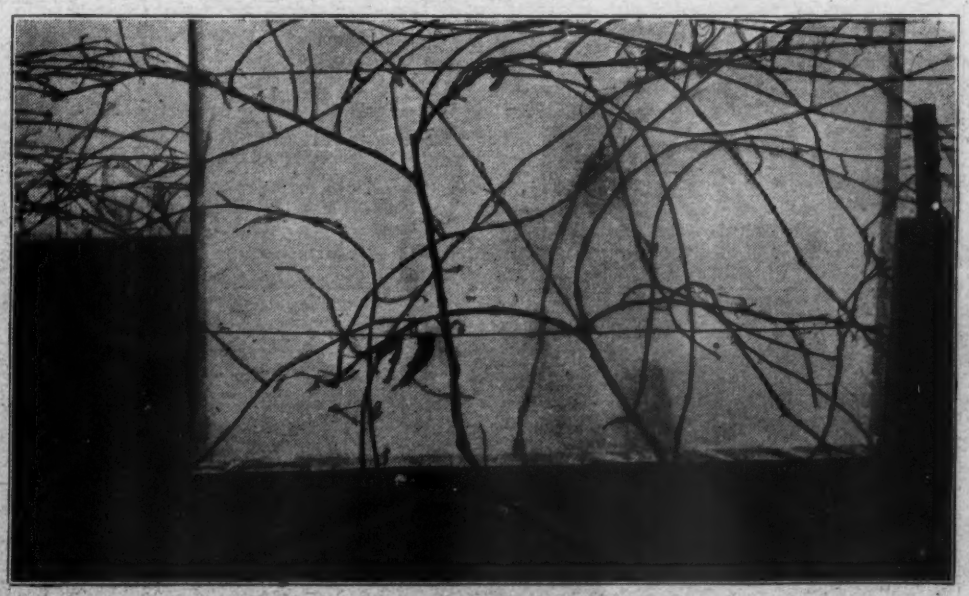
Training to single stakes, as has been mentioned, is a declining practice, although still largely used in some localities. In this case a strong, slender post or stake about six feet in length is driven firmly into the soil at the time the vines are planted. Only one cane is allowed to grow the first year and this is kept tied to the stake. If the vine is sufficiently vigorous it may be left to form the permanent trunk. If weak, it is cut back to two or three buds and the permanent trunk obtained from one of the new buds the following summer. In the subsequent pruning, the trunk is headed back at the top of the stake, and lateral branches cut back to spurs.

The principal advantage of this is that the vines may be cultivated both ways. It has a disadvantage in that the fruit is covered with a dense canopy of leaves, and the bunches are more or less irregular and mutilated by growing and being picked from the many shoots and spurs.

The Munson System

A generation ago, T. V. Munson of Texas, tested the various methods of training grapes in order to determine the cheapest and best method of training grapes in the southwest. His efforts resulted in the form of trellis now bearing his name. This trellis is formed by setting posts at every second or third vine, with cross arms spiked to the tops. The posts may be high enough to cultivate crosswise under the trellis. Munson set the posts so that they were four and one-half feet high.

Small holes are bored through the ends of the cross pieces and through the center of each post through which the



An Unpruned Vine Trained in the Two-Trunk Kniffen System.

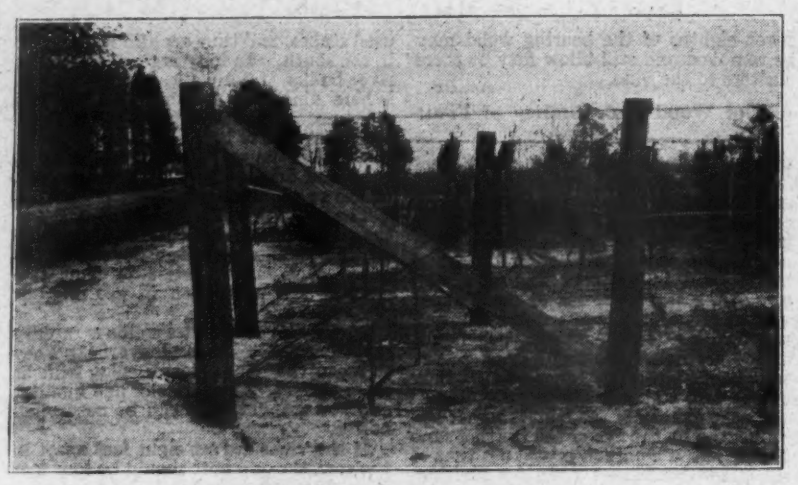
wires are strung. As the center holes are a few inches higher or lower than the cross-arm holes, the three wires form a ridge, or V-shape, which the outer wires about two feet apart. The vines are trained to stakes the first summer, after which the trellis is built and a single trunk cane carried to the middle wire, with arms allowed to form in each direction along the trellis. As the fruiting shoots develop, they are draped over the outer wires. This allows the fruit to develop in perfect clusters and be protected by the foliage, yet well ventilated. This system of training is much used in the south and southwest, but the fruit is too much shaded for the north.

There is no one system of pruning or training that is best for all purposes. The drooping system is especially good for vigorous growing varieties. The upright form of training eliminates much of the old trunks, which is thought by some to be an advantage, as the wood on the trellis then is mostly one year old. The upright system is especially good for weak growing varieties. Most methods admit of pruning by either long cane or spurs.

The Kniffen System

This method probably is used to a greater extent in training our northern native grapes than any other. A suitable trellis consists of two wires, the first of which is located about two and one-half feet from the ground, and the other at five feet.

During the first season, it is a common practice to allow the canes to run over the ground like melons or cucumbers. It is better, however, if these young canes are trained to a stake or to a cord running from the base of the vine to the trellis so as to obtain a single, straight, vigorous cane which will not have a permanent, unsightly crook near its base.



Method of Bracing the End Posts in a Vineyard.

The second spring, the vines are again cut back to two or three buds, just as they were pruned the first spring. The most vigorous shoot then is allowed to grow, and should be trained to a stake or cord running from the base of the vine to the trellis. When this cane becomes long enough to reach the second wire, its growing tip is pinched out or cut off, and the cane is induced to form laterals at the height of the trellis wires. These laterals are trained along the trellis wires, and become the permanent arms.

In the so-called improved Kniffen system, the trunk is made to divide below the lower wire, as this has been found to regulate the flow of sap so that the growth along the lower wire is nearly as great as along the upper wire. This divided trunk is obtained the second summer by pinching back the shoot at or below the lower wire. The permanent form can be gotten the second spring after planting, if the vines are carefully cultivated, pruned and trained. These canes can be rejuvenated from time to time by permitting a young shoot to develop from near the ground. Such a shoot is treated for two years exactly like a new plant during which time the old cane is producing fruit. The old cane then is cut out and the rejuvenated vine left to bear its first crop.

Regardless of the form of trellis that is used, or the particular style of training that is used, the vines must be tied to the trellis wires quite firmly with some material that will not break before the vines have made a good start. As soon as the young shoots begin to grow, the tendrils will hold the vines securely to the wires. In the case of heavy trunks, small wire, willow or wool-twine has to be used. The tie is best made by wrapping the twine twice around the wire and tying in a hard knot, after which the twine is wrapped twice around the vine and again tied in a hard knot. This prevents the cane from being injured by rubbing back and forth against the wire where the tie is made and holds the vine firmly to the wire.

The pruning and training of grape vines is not a difficult operation, although it too often is so considered by the inexperienced. There are a few fundamentals about the operation, which when once grasped, makes the operation become extremely simple. In fact, there is less perplexity about grape pruning than there is about pruning tree fruits.

Present Status of Orchard Fertilization

By W. H. Alderman, University of Minnesota

SINCE the beginning of agriculture man has recognized more or less distinctly the advantage and in some cases the necessity of fertilizing or feeding the plants he grew. The first fertilizing material was manure, but it was early recognized that extra cultivation would produce results similar to that of manure. Thus gradually developed some knowledge of desirable cultural methods. It was not until 1840, however, that the problem of artificial feeding of plants was forcefully brought to the attention of the agriculturists by the work of the chemist Liebig who held that certain chemical materials were removed from the soil by the plants and that these could be returned to the soil in chemical form. The establishment of agricultural experiment stations a few years later gave ample opportunities to test the efficacy of artificial fertilizers upon a wide range of plants, among them the apple. It seemed an easy first problem to attack but time has proven it to be one of the most difficult to settle.

The apple presents numerous difficulties to the man who would study its fertilizer needs and requirements with the view of determining them for more than a single orchard or locality. In the first place it comes from a plant species so plastic that it readily produces forms or varieties adapted to a wide range of soils, climate and topographical conditions. This ability to adapt itself to all manner of conditions which makes it so valuable to man also makes it a difficult subject for man to study and encompass by rules and general principles. It is obvious that its nutrient requirements will vary with the soil, with the general cultural system followed with the varieties considered and probably with the pruning.

There has been too great a tendency upon the part of both growers and experimenters when they have discovered favorable or unfavorable reactions from a fertilizer in their own orchard, locality or state to widely proclaim the results and establish more or less general recommendations for others to go and do likewise. We now understand that this is an unsafe policy. In this article the writer will try to show how unsafe it may be by reviewing the work of a considerable number of experiment stations and in a later article will endeavor to point out a rational course of procedure for the orchardist.

Trees in Sod Have Given the Best Response to Fertilizers.

New York

One of the first stations to plan and carry out orchard fertilization tests was the Geneva Agricultural Station in New York. They have completed the twentieth year of a well organized duplicate plot experiment, testing stable manure and the three elements of plant food materials in commercial form. The soil is a heavy clay loam and has been given annual cultivation followed by non-leguminous cover crops. At the end of twenty years it is reported that the gain following the use of the fertilizers was inconsequential and did not offset the cost of the applications. Two other experiments have been conducted by this station. One covering a twelve year period comprised a study of the effects of phosphorous, potash and lime upon bearing trees and this also failed to show sufficient benefits to warrant the application. The other experiment was of short duration and consisted of a study of nitrate of soda under sod culture and cultivation. Clear cut benefits were observed when applied to trees in sod but under cultivated conditions its effects were neutral.

Pennsylvania

In sharp contrast to the New York results are those secured in Pennsylvania where extensive tests have been conducted for 10 years in six bearing orchards and additional experiments have been made upon young trees. In all, data was taken from over 1100 trees and more than 1200 barrels of fruit have been harvested from the plots.

Three of the bearing orchards were given sod treatment and three were under cultivation. Only one, a cultivated orchard, failed to show adequate gains as a result of the fertilizer treatment, but the three sod orchards gave by far the most satisfactory gains from the use of the fertilizers. Manure gave uniformly better returns than did commercial materials. Of the three elements of plant food materials, nitrogen proved to be the most important. Frequently phosphorous or potassium combined into nitrogen gave better yields than did nitrogen alone, but neither gave uniformly satisfactory returns when used alone. In, at least, three of the orchards phosphorous failed to give any benefit and in three potassium was a total loss. Upon the whole, the series of experiments indicate that there are many orchards in Pennsylvania that will be benefited by the use of commercial fertilizers.

West Virginia

The West Virginia station has completed nine years of experiments, involving 368 trees of various ages and conditions. Inasmuch as these were under the immediate observations of the writer it is hoped that he may be pardoned for describing them slightly more in detail than the others. Our test is made up of old-bearing trees in a soil low in fertility; a second begins with trees newly planted in a moderately productive soil; a third consists of young bearing trees in a fairly fertile soil, and the fourth deals with young bearing trees in a starving condition upon very poor soil.

In each case the soil was kept cultivated until midsummer or a little later and then seeded to a cover crop, thus avoiding the uncertain influence of sod. The results are considered first from the standpoint of tree growth and next from the standpoint of fruitfulness.

In the old bearing orchard the trees have been gradually improving in annual growth in the check, as well as in the fertilized plots, due to good orchard management. In addition to this general increase all the plots to which nitrogen has been added have shown rather substantial growth gains over the check plots, while phosphorous and potassium have given only a slight and insignificant increase.

In the case of the young trees where the soil was more fertile there were clear-cut advantages uniformly derived from any of the treatments, although nitrogen and phosphorous when used in combination, gave some insignifi-

(Continued on page 52)

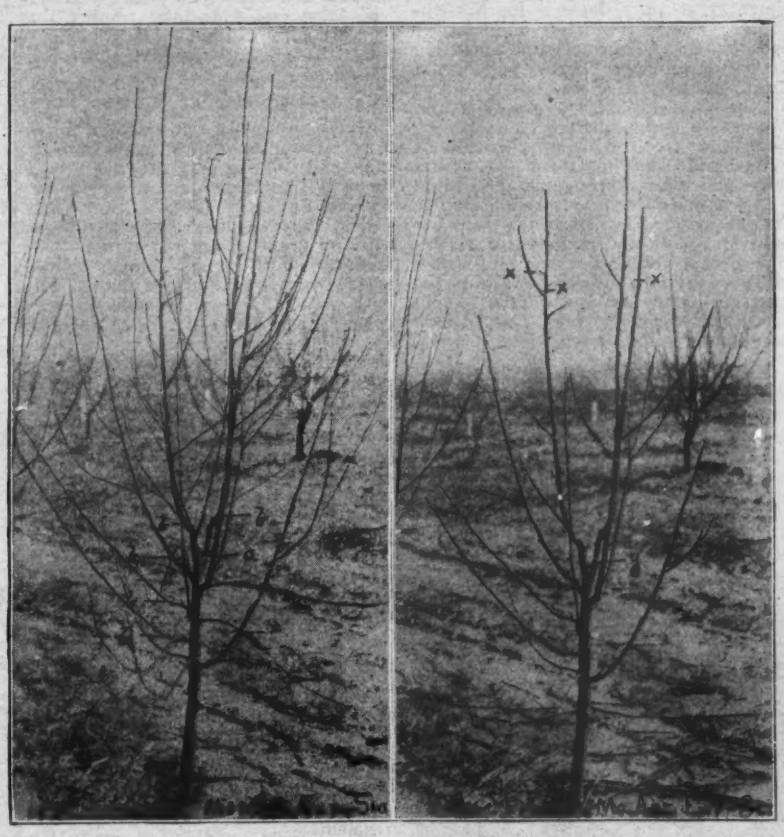
Training and Pruning Orchard Trees

By V. R. Gardner, University of Missouri

NEW questions in connection with the raising of fruit trees have given rise to more differences of opinion or have caused more discussion than that of pruning. Furthermore these differences of opinion are often extreme. One grower may advocate very little pruning; another a great deal. One grower recommends and practices summer pruning, perhaps to the exclusion of winter pruning; another would, under no circumstances, permit any summer pruning in his orchard. Some growers are loud in the praise of certain styles or types of trees, like the open-centered type; others are equally positive in their condemnation of these same styles or types. The fact that advocates of both extremes are often about equally successful as orchardists serves to make the problem more difficult rather than easier of solution. It suggests that the pruning problem is not just a single question, but rather a series of questions; and possibly most rapid progress will be made in its solution, when in our discussions we divide it into its component parts and attack them separately.

The Difference Between Training and Pruning

One of the first questions to arise in connection with the development of the young orchard is that of how the trees shall be trained. Shall they be grown as central-leader, open-center, or modified-leader trees? As a matter of fact, strictly speaking, this is not a pruning question, but rather a question of training. Theoretically it would be possible to train one fruit tree to an open center and another to a closed center, or leader, type and not touch either with a pruning tool. This could be done by tying or otherwise fastening the limbs in their places, much as we do in the case of grapes. Of course in actual practice this would seldom or never be done, but the illustration serves to bring out the fact that pruning is not necessary in order to give trees certain predetermined styles or shapes. Conversely it is easily possible to prune two trees, one an open-centered tree and the other a leader type, with equal severity and still have them typical of their respective styles. It is desirable to keep in mind this distinction because growers often think that if their trees are well trained according to some standard style or type that is all that is necessary. They imagine that little pruning will then be needed, or at most pruning will consist of a little trimming that will serve to maintain the same general shape that has been adopted for the orchard. This may prove to be far from the case, for it is possible to find trees that have been very well trained, but that are in bad need of pruning. On the other hand it is possible to find trees that have been well-pruned, but very poorly trained. Training has to do with shape, with form, with framework; pruning has to do more directly with function, with behavior, with what the tree does, with what it produces. Both training and pruning are necessary if the best results are to be obtained; but so far as possible the grower should separate the two questions in his mind, even though he does not work out their solution entirely independently in the orchard.



Left—Vigorous Two-Year-Old Jonathan, Headed at (a), Severely Pruned First Season at (b). Right—Same Tree Pruned Again. Two Shoots Should Have Been Cut at (x) to Correct the Fork at (y).

Styles of Training

With this introduction let us proceed briefly to describe the different standard styles of trees and to explain how they may be developed. The closed-center or leader type of tree is perhaps the most commonly seen, the easiest to develop and the easiest to describe. It is a tree in which the central limb has been given a better chance to develop than the side limbs. To a certain extent this central limb has grown at the expense of the laterals. It may have been pruned back more or less frequently in the course of development of the young tree, but always the lateral branches have been subordinated to it. It has been given the lead over them. The result is a tree that more or less crudely resembles one of the cone-bearing evergreens like a hemlock, or pine or spruce. The central axis reaches to the top of the tree and from it arise lateral branches at varying heights.

As already indicated the method of training this type of tree consists simply (1) in never removing entirely the central limb and (2) in cutting back this leader less severely than the laterals. Naturally this type of tree comes to possess more scaffold limbs than trees of other types. Some will be those selected at the end of the first year in the orchard; there will be others coming out a foot or more higher, from near the end of the first season's growth; and there will be still others coming out still higher from later growth of the trunk or central axis. These scaffold limbs are smaller and they make stronger shoulders with central axis. The result is a tree that is mechanically one of the strongest, comparatively free from crotch injury and crotch splitting. On the other hand, unless pains are taken a tree of this type becomes more brushy than one of the other types, fruit spurs in the lower part are apt to be less regular in flowering and bearing and fruit is apt to be less highly colored.

The Open-Centered Tree

The open-centered tree, as the name indicates, has a comparatively open center. At least the axis does not run through the center of the top, but terminates two or three feet from the ground where the main scaffold limbs branch out from it. The main scaffold limbs, some three to six or seven in number, generally come out comparatively close together and take an outward and upward direction. In developing this style of tree the central leader is removed entirely, or checked and made subordinate to the laterals by heading it back more severely than they are. Should new branches arise in the center of the tree to replace the removed leader, they too are taken out or are cut back rather severely to subordinate them to the outer limbs.

At this point it may be well to digress long enough to note that in developing the open-centered tree it is far better to subordinate the leader and other interior branches by comparatively heavy heading than to attempt to eliminate them by cutting out entirely. When the center is removed entirely, water sprouts are almost certain to arise to take its place and prove a constant annoyance. By subordinating the leader and other interior limbs not only is the water sprout problem largely eliminated, but the interior growth serves to prevent sun scald in the crotches and in due time may be made to produce fruit spurs, fruit buds and fruit.

The open-centered tree, theoretically at least, possesses the advantage of exposing its leaf surface, spur system and fruits more fully to sunlight and of facilitating certain orchard operations, such as pruning, spraying, thinning, and picking. On the other hand it is mechanically weaker than the leader type of tree, in that there are fewer and larger scaffold limbs that are more apt to split down at the crotches when heavily loaded and subjugated to high winds.

The Modified Leader

The modified-leader type of tree, as the name indicates, is intermediate between the other two. It is a tree that has a central axis some five to seven feet high and then has an open center above that point. It is developed by training the tree to the leader type for three to five years, after which it is trained to the open-centered type. The result is a tree with a larger number of scaffold limbs and a stronger frame work than the typical open-centered type, and at the same time a less brushy top than the leader type. Theoretically at least, it possesses most of the advantages of both, and practically none of their disadvantages. Be this as it may, it is gaining in popularity in a number of fruit growing districts.

At this point it may be well again to mention the fact that these three types or forms of trees are only styles, and in the last analysis the matter of style is one of secondary importance. One style may suit the fancy of one grower better than another style, or possibly it may be somewhat better adapted to some particular variety he is growing or condition with which he has to deal; but that does not make it the best style for all varieties and for all purposes.

A tree may be trained to any one of these three styles and still be a well-trained tree; and regardless of the style of training it may be well or poorly pruned and comparatively productive or unproductive. In this connection attention may be called to the fact that the question of style or form of tree

(*Continued on page 56*)

Water Sprouts, the Result of Heavy Pruning to Produce an Open Center. "Rangy" from Failure to Shorten the Main Limbs.

Same Tree as on Left. "Ranginess" Corrected by Heading Back Main Limbs Into Two-Year-Old Wood, and Outward Growing Laterals.

What Will Be Done With the Wine Grapes?

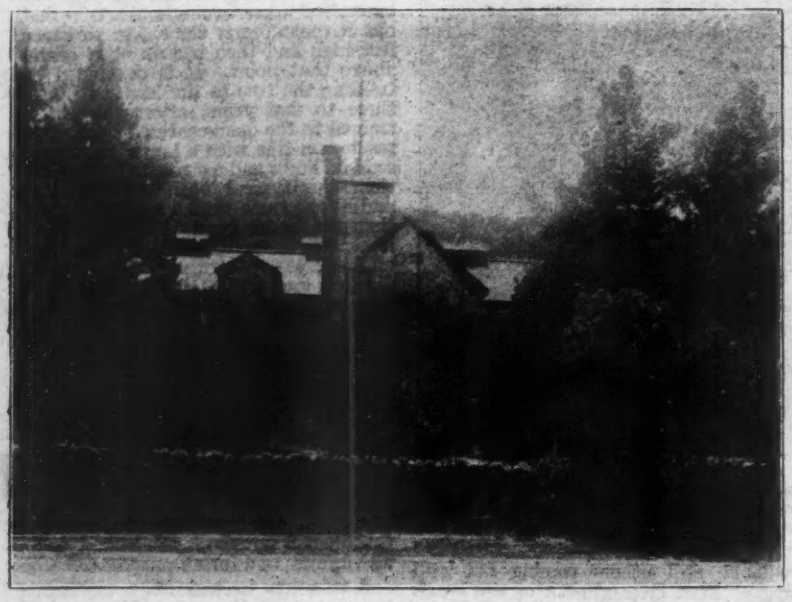
By William V. Cruess, California

NATIONAL prohibition has forced California vineyardists and owners of wineries to do some tall thinking and much more tall hustling to forestall serious if not absolute loss of the state's $25,000,000 wine grape crop. The government offers them no financial aid. All that is done, therefore, to avert ruin must be done by private capital, and private capital will at best in this case be taking a long chance. But western capital has always been willing to take a risk where the stake has been found worth while and is not found wanting in this spirit in the present situation.

What are Wine Grapes Good for?

If one is partial to good wine, there is, of course, only one answer: wine making. But suppose, for the sake of illustration, that all of us are not acquainted with Haute Sauterne, Riesling, Chablis, Zinfandel, or even Claret, unfermented juice, and the amount produced has been decreasing annually. Naturally we ask why.

The most evident cause of failure has been the choice of grapes of poor flavor, and flavor is the one big factor upon which grape juice depends for quality. Of the varieties available, in quantity, only one has a marked and agreeable flavor; or, in other words, possesses a "kick" that can rival the intense flavor of the Concord. This grape is the Muscat, a grape grown in enormous quantities for producing the famous "Sun-Maid" raisin, known to housewives and bakers throughout the United States as one of the finest products of the Golden State. The first crop of Muscats is used practically entirely for raisins but there is always a second crop which matures too late to be dried and is too sour for raisin making. This second crop was formerly used for brandy manufacture and sweet wine making.



Some of the Larger Wineries are as Imposing as Baronial Castles

sometimes lightly called "paint," and even less polite names; then a considerable range of products is presented to us. On hot days, nothing (if we omit the foamy product of the hop and barley) satisfies our thirst so well as does a glass of rich, red, full-flavored grape juice, mixed with crushed ice and a little seltzer water.

Or, on a frosty morning, when buckwheat cakes with nice thick layers of butter between them are in style, a generous spread of deep red grape syrup with a full rich jelly flavor will make 'em taste "so good" that the hired man will like his job and think that farm work isn't so bad after all.

There is also grape vinegar. The word "vinegar" itself is derived from "vin" (wine) and "aigre" (sour), meaning sour wine. The apple has imposed upon the grape by appropriating to itself all credit for this word. Grape vinegar from white grapes is unexcelled for flavor and strength when properly made and when brilliantly clear is a beautiful product.

Dried wine grapes are not good table or cooking raisins, but may have a future for export purposes. They can be dried, but selling the dried article is the problem.

An excellent jam, free from skins, seeds, and stems, can be made in any quantity and sold as a cheap spread to replace the butter substitutes that are now gaining favor because of their cheapness.

For denatured alcohol grapes are worth five dollars per ton; less than the cost of picking and delivery.

The wine grape crop of this state is large enough to supply ten times over the past grape juice market; yet only one half of one per cent. of the state's wine grapes have been made into

The sourness of this second crop makes it all the more desirable for grape juice because both flavor and tartness are essential. California's juices produced in the past have violated both of these laws and have been both tasteless and too sweet.

Most of us prefer a juice of deep red color. The Muscat is a white grape, but by blending it "fifty-fifty" with red wine grapes, ample color can be obtained. Red wine grape juice for color blended with Muscat juice for flavor makes a combination which is difficult to equal.

The University of California has developed a system of processes by which the manufacture of this juice can be carried out by any one of the many former wine makers. The red wine grapes must be gathered when the sugar content by the grape grower's sugar tester is about 18 to 20 per cent. and the Muscats at about 22 per cent.

The wine grapes are crushed and stemmed. The juice is pressed from them, is heated to 140°, and returned to the skins for about eight more hours to leach the color from the skins and to make the grapes press easily. Heat draws out the color into the juice and destroys the slimy consistency of the crushed fruit. They may then be completely pressed in ordinary wine presses and the juice strained to remove particles of pulp and seeds.

If placed in bottles at once the juice would turn cloudy and would deposit cream of tartar crystals. In order to clear it, it must be heated to 175°, run hot into 20 gallon glass carboys still hot from a sterilizing steam bath; the carboys must be stoppered with corks sterilized in hot paraffin and the bottles stored until February or March. This storage causes the juice to become clear and to rid itself of tartar.

The Muscats are handled similarly, except that the juice is not heated on the skins but is pressed from the freshly crushed grapes and stored in glass as described for the red juice.

During the following spring the carboys may be opened; the juices are drawn off, filtered, and blended in equal proportions. Then comes the final sterilization in bottles of juice immersed in water heated slowly to 175° for 30 minutes.

The juice is a wonderful purplish red in color, clear in appearahce, and has the full rich flavor of the Muscat. All who have seen this juice predict that Concord juice will have a hard battle to retain its present supremacy over the California product.

The Possibilities of Grape Syrup

Grape syrup has two possible important markets: one for use in the home for table and cooking purposes; the second, for export to foreign countries for wine making. The California State University has made scores of different types of grape syrup; red syrups, pink syrups, white syrups, amber colored syrups, syrups with a sour taste, syrups with no acid, and all possible shades of color and acid between those enumerated. Syrups have been made in vacuum pans, by drying in the sun, by boiling down in open kettles, and by freezing. After all was said and done, only two of the different lots seemed to have commercial possibilities. One of these was a deep red syrup made by concentrating the red juice under a vacuum. It is deep purplish red in color and possesses a "blackberry jelly" flavor. It is a fine table syrup.

The second syrup was made by the freezing process developed by Dr. H. C. Gore of the United States Department of Agriculture, Bureau of Chemistry. Muscat juice was frozen at 10° to a mushy mass of ice crystals and syrup. The crystals were pure water. The mass was whirled in a laundry centrifuge to give a light syrup of delicious flavor and practically sugar-free ice crystals. The ice was found to contain about 1 per cent of cream of tartar which was obtained as a valuable by-product by melting the ice.

By freezing the syrup a second time at zero, it was found possible to condense it to 55 per cent sugar by the Balling test. Freezing removes water as ice crystals and leaves all of the flavor in concentrated form in the syrup. But syrup of 55 per cent sugar is too thin to keep without sterilizing and from Muscat grapes is white in color. It was found that a blend of equal parts of Muscat syrup made by freezing and a heavy red syrup of 72° Balling test made in a vacuum pan was both rich in flavor and deep red in color. It may be used as a fountain syrup on ice cream specials or as a base for drinks when diluted with carbonated water. Breweries are well equipped for its manufacture.

Either of these syrups may be exported to foreign countries for wine making purposes. A ton of grapes will yield about 50 gallons of syrup. If this should sell at $1.25 to $1.50 per gallon, f. o. b. factory, it would return the grower a good living price for his grapes.

Dried Grapes

Evaporators are being erected in certain sections of California for use in drying the grapes; in other sections the grapes are being dried on raisin trays in the sun. It is hoped that a market will be found for these for stock feed or for export purposes for enough to pay picking and drying. A ton of grapes will yield about 500 to 550 pounds of raisins. Because of their high percentage of seeds and their tough thick skins it is not believed that such dried grapes will be suitable for table use. Experiments will be made upon removing the seeds by the machines used for seeding Muscat raisins. It is expected that the seeding will cause a great loss in weight, but if otherwise successful may open up a large market for the dried wine grapes for bakery and household use.

Other Products

Grapes are rich in sugar—practically twice as sweet as apples. They may be fermented and turned to vinegar by methods in use for cider vinegar manufacture. By diluting wine vinegar to 40 grains strength, the strength of ordinary cider vinegar, one ton of grapes will yield 250 gallons of vinegar compared to 150 gallons from apples. But the problem is one of marketing and competition with cheap cull apples. No matter how cheap vinegar may be no one is going to use more of it on that account. It is a commodity of which it is almost impossible to increase consumption.

Grapes may be crushed and stemmed in an ordinary wine grape crusher. The crushed product may then be passed through a tomato pulping machine to separate the pulp from the seeds and skins. If a red pulp is desired, the crushed grapes must be heated before pulping. The pulp will be too thin to use without concentrating but may be boiled down in a vacuum pan to a thick consistency; but a much better plan is to add an equal quantity of juice from boiled apples and make the mixture into a jelly-like jam by boiling down with sugar. This prevents the separation of cream of tartar which would otherwise take place, giving the jam a gritty texture.

Growing Other Crops

A few growers are grafting their vines over to Zante Currant grapes, but this is a costly and difficult process. It is very doubtful whether any great quantity of these grapes, dried to make currants of commerce, could be sold in competition with currants from Greece. It is, however, an interesting venture.

Many vineyardists have uprooted vines at intervals in the rows and have planted prunes, walnuts, or other fruits adapted to the soil and climate. Much of the land in Sonoma, Napa, and Mendocino Counties has been shown by soil surveys made by Professor S. T. Shaw to be suited only to grapes or for pasture land. The owners of these vineyards face a heavy loss unless one of the new grape products shall prove a commercial success.

Many growers can not bear the heavy financial burden made necessary by planting and bringing other fruits to a bearing age of five to ten years. These men feel that state or the United States government should compensate them for their loss or at least loan them money on long terms at low rates, and there is much merit in their contentions.

Even granting that several possible outlets of wine grapes prove fairly successful, the growers have only a long gambling chance of saving themselves from disheartening losses and in many cases absolute financial ruin. But they will fight the game through and will salvage everything possible from the impending wreck.

PROTECTIVE TREE PAINT

Below we give the formula which has been sent us, and we would be very glad to hear from any of our subscribers who have used this paint. Will they tell us just what their experience with it has been?

One-half pound rosin; one-half ounce lye in one half pint water; one quarter pound tallow; one quarter pound ochre; one-eighth pound plaster of Paris; three ounces tobacco juice.

The tallow is melted first and then the other ingredients are added to the boiling solution in the order given.

The cost will not exceed three to four cents for each tree painted in this manner. Rabbits, field mice and insects of all kinds are repelled by the tobacco juice. To obtain the juice, steep a few tobacco leaves in water and then drain off the juice.

From another source comes advice as to rodent control which advocates clean cultivation as the first and most important measure. No brush piles, grown-up fence rows or ditches should be tolerated as these invite meadow mice. The Biological Survey recommends the use of strychnine sulphate. Here is the formula:

"To treat grain dissolve one ounce strychnia sulphate in two quarts boiling water, add half a pint of cold water in which two tablespoonfuls of laundry starch have been dissolved and boil the resulting solution until the starch is clear. Pour it, while still hot, over one bushel of grain (cracked wheat or crushed oats) stirring continually so as to distribute the poison evenly. Let the poisoned grain stand over night and then place a teaspoonful of poisoned bait in mouse runways or the openings of burrows."

With Our Editor

On Borrowing and Lending

PERHAPS the safest thing to say about this is what Shakespeare wrote so long ago: "Neither a borrow nor a lender be, for often oft loseth both itself and friend." We know this to be true, yet when we think of the many ways in which friendly lending and borrowing helps a community, we cannot fully endorse his advice. Rather would we regulate the habit by the line from the book plate of a generous lover of books, "Borrow 'tis well. But ah! return."

Most people really enjoy the kindliness of lending, and all would do so were it not for the deplorable negligence of borrowers. A little goes a long way when it is passed on from hand to hand. The newest book may brighten a dozen firesides even if it is owned by a single individual. The road drag which is the property of but one, may smooth the way of many. All of us must recall that we have both asked and given assistance of this sort in a hundred little ways.

Alas! most of us can also recall that we too have borrowed upon occasion and then, the use to which we have put the article being over, we have waited for a more convenient season until sometimes the owner is compelled to ask for its return. And here an unreasonable but very human thing happens. We are irritated that they should demand their own. It is a reflection upon us. Don't we deserve it? Well, yes; but it is so uncomfortable to be reminded. The reader knows so well (perhaps from personal experience) that this irritation will follow his request, that he postpones it until he has suffered considerable inconvenience. Next time he may not be so willing to lend. But whose fault is that? His or yours? "Borrow 'tis well, but Ah! return."

Better Tractor Service Needed

TRACTOR manufacturers and dealers who act as if they expected farmers to be skilled mechanics are missing a big bet, while those who take into account that men living in the country cannot reasonably be called on to make their own repairs when the tractor needs them, will do more intelligent and bigger business.

Many a farmers wants a tractor. He needs the relief it will bring from the scarcity of labor and the high cost of horse feed. He is willing to pay the price for a machine that the experience of others has shown to be a money-saver. But the tractor is temperamental. When it is good, it is very, very good, but when it is bad, it is horrid. The farmer hesitates a long time when he hears of some neighbor waiting despairingly through the rush season for lack of someone who can find out what is the matter with the darn thing and start it once more upon ways of pleasantness and paths of peace.

Taken all in all, it is rather surprising how well farmers as a class manage these machines. It reflects credit both on the tractor and the operator, but not every one comes into the world a ready-made mechanic, and a farmer's opportunities for gaining such knowledge are few. He would do much better were he given a sufficient number of lessons from an expert and if when trouble comes as come it may at any time, he could call on that able man to rush to his relief.

An increasing number of tractor manufacturers are thus coming to the farmer's aid. Purchasers of their machines are instructed and looked after. Local dealers are plentifully supplied with such parts as are most apt to be called for, so that valuable time may not be lost at critical seasons while the tractor owner waits anxiously for some simple thing to replace a lost or broken piece. Such firms, provided they are putting good, honest machines on the market, will reap a golden harvest of popularity.

Motor Trucks, Express Routes

WHEN a big and efficient state like New York, sends a report to its governor through the Committee on Food Production and Distribution, strongly recommending a certain course, we who are deeply interested on the production and distribution of food may well pause to inquire what was the course so cordially recommended.

The New York State Reconstruction Commission worked through the above mentioned committee to urge the operation of rural motor-truck express system throughout the state, for facilitating the delivery of perishable foods. It was urged that the benefits of such a system are reaped by both producer and consumer. Food arrives at its destination far fresher and with far less loss than when transported by rail. The elimination of loss enables the farmer to make a lower price to the consumer, who thus gets a better product for less money.

It is no new thing to call attention to the unreliability of freight trains. Congestion, delays, wrecks, all unite in making the farmer's profit uncertain. Tests made with motor truck loads of eggs and chicks starting for their destination at the same time as similar loads sent by rail, resulted in the saving of days of time and of practically the entire shipment of eggs and chicks, which by the rail route suffered great loss by delay, by breakage of the eggs and death of the chicks. Tests with other perishable foods resulted similarly.

Roads, also, benefit by the use of motor-trucks. The wear and tear of the truck upon the surface of the road is far more than counter-balanced by the necessity which the users feel to keep the routes in good condition. A motor-truck express route is sure to be a good road. The first transcontinental trip of an army motor truck train between Washington, D. C., and San Francisco, should prove illuminating to those who still doubt the practicability of motor trucks for very long hauls.

Income Tax Returns

THE COMIC papers run series that are funny enough to make an undertaker grin, under the caption "Movie of a Man Making Out His Income Tax Returns," but it isn't so comic for the man. The process, as worked out on most farms, begins with a spirited "Here goes!" followed by a staccato howl of "Ouch!" as the tax pinches the pocket-book harder. After that, while the poor dear wrestles with an untidy mass of figures, his ejaculations become increasingly unfit to print.

The job is at best a nuisance. When accounts have not been kept, it frequently wastes days of valuable time. Many find it almost worse than the actual payment of the tax, though we have yet to meet the man who joyfully releases to the government any large proportion of his hard-earned wealth. Still, most of us have a conscience and wish to do the right and lawful thing, and, besides, we are averse to being found in the wrong.

Unless one has some system of book-keeping, he becomes hopelessly involved, loses his time and temper and mayhap, his money also. One man we learned of last week, after narrowly escaping nervous prostration, sent in his returns too late, was fined for so doing and, after all, paid twice the amount really due. He discovered this two years later, after the error had been repeated, and then he turned in despair to keeping books.

There are simple and excellent systems of farm book-keeping. If you have never done so before, better decide now to keep accounts and to keep them accurately. It is a wonderful help and will smooth your path in more ways than you anticipate.

Lady Astor Owns Virginia Orchard

BOTH amusement and interest have been felt in the picturesque campaign lately carried to a successful finish by Lady Astor, who now sits as the first woman member of the British Parliament. The idea of an American woman being the first to break the old tradition of England, rather tickled the fancy of her fellow countrymen. Hosts of friends in the United States, with whom she has kept up unbroken associations since early days, have cordially wished her well. We are glad to tender our congratulations to this sprightly daughter of "ole Virginny." It is but a few years since Lady Astor purchased from the Editor of the AMERICAN FRUIT GROWER the first apple orchard owned by him in Albermarle County, Virginia.

One Man's Success with a Cherry Orchard

By Wallace D. Coffin, Wisconsin

I AM writing this article for two reasons; first, because it is the real experience of a man who has had a most remarkable success with a small cherry orchard; second, because one man's experience generally proves helpful to another. I am not embellishing the facts, but am writing them just as they occurred, with the hope that they will prove helpful and interesting to the readers of the AMERICAN FRUIT GROWER.

Frederic Berger, Door county, Wisconsin, is the man whose experience with cherries has made it possible for this article to be written. Mr. Berger's success with his small cherry orchard is nothing short of marvelous. Yet, the comforts that he and his family now enjoy, cannot be credited to cherries alone. Fruit offered a means of putting his farm on a more profitable basis. Mr. Berger realized this, and has, by perseverance, hard work and thinking, got all the profits that a good orchard offers.

First, I will give figures showing cost of planting and caring for the orchard, and afterwards tell the story of Mr. Berger's experience in bringing the orchard to its present high standard.

The orchard was planted in the spring of 1911, which makes the trees eight years old last spring. You will notice that the orchard is not charged with any expense for the first three years. Cultivated crops were raised in the orchard the first three seasons. "Thus," Mr. Berger said, "I got the orchard cultivated, and the crops paid the other expenses."

These figures show the excellent profit this small orchard has produced in the first eight years of its existence. From them one can form a pretty definite estimate of what it will do in future years. This orchard is nearly twenty miles from a railroad, and a like distance from any town over a thousand inhabitants, so the land holds none of the high valuation credited to land near a city. Yet last season the orchard produced a clear profit of nearly $270 an acre, though it has just entered its bearing age.

To realize more fully just what Mr. Berger has accomplished with this orchard, let us examine the above figures more closely. All together, it has produced a profit of about $3,350. Subtract the introductory expense of $300 for trees and planting, and there is a balance of $3,050. This gives Mr. Berger a net profit of $38 an acre for the eight years.

Prior to the time of planting the orchard, Mr. Berger confined his efforts to farming only. "I was farming 120 acres," he said. "But poor crops came as often as good ones. On the whole, I saw it was a pretty uncertain way to earn a living and pay the mortgage too.

"There was quite a cherry boom sweeping this part of the state at the time. Some were already making money from their orchards. Until then it had never occurred to me to plant an orchard myself. Suddenly it struck me that cherries offered a better chance of making money than did raising corn and wheat.

"We talked it over at home with the result that I decided to plant ten acres to cherry trees. And" he added as we walked down through the clean floored forest of trees bending beneath the scarlet red of a $270 crop, "this is the wind-up." As I watched the truck whirl away to market with a load of fruit, I couldn't help thinking that it was a very good wind-up, indeed.

But caring for a 10-acre cherry orchard isn't all counting the profits. To properly farm a 120 acres will test a man's metal. But caring for a 10-acre cherry orchard in addition, does more than that. It tests his industriousness and energy.

For instance, Mr. Berger did all the spraying for the first three years with a three-gallon hand sprayer. Then a barrel sprayer was bought. "But didn't you get tired of it," I asked, "and think of neglecting the orchard, when a rush of farm work came?"

"Of course I got tired of it," he answered. "But I never thought of neglecting it. I knew the better care the orchard got in its early years, the better it would pay when it started bearing. No, I never thought of neglecting the orchard. If a rush season came I hired an extra man, if that was necessary."

Mr. Berger's belief has proved correct. Good care is evident, both in the appearance of the orchard and the quality of fruit it produces. I have seen letters received from outside customers in which they speak of his cherries as the finest they have ever seen or eaten.

The Power Sprayer at Work in Mr. Berger's Cherry Orchard.

Mr. Berger has easier methods of spraying now, however. He bought a power sprayer in 1917, which enables him to do better work in less time. And it makes the work more pleasant, too.

Mr. Berger's trees began bearing the second year. Ninety quarts were picked that year. The yield increased rapidly until the orchard yielded 110 crates the fifth year. This was only about a third of the crop, a windstorm destroying the remainder.

The sixth year, 1917, the orchard yielded a bumper crop for trees so young. As the figures show, it produced a profit of $60 an acre. That is at least three times the profit from an acre of grain, and it surprised even its owner, although he knew that the trees were rapidly becoming capable of big production.

When cherry picking time comes, Mr. Berger's usually quiet farm changes into a settlement of noisy but happy pickers. Picking time is no doubt the most pleasant time of the year. Everybody gets their fill of the luscious Early Richmonds and giant Montmorency, so the work of harvesting the crop goes on without a setback. Mr. Berger's orchard is composed of five acres each of Early Richmond and Montmorency. As the Montmorencys are about two weeks later than the Early Richmond, Mr. Berger has no trouble in getting the crop harvested at the proper time.

Last season Mr. Berger hired a force of about thirty-five pickers. Although there are other orchards in the vicinity, he has no trouble in finding plenty of help. The work is both pleasant and profitable, and the older as well as the younger people are eager to try it.

The cherries are hauled directly from field to market. Mr. Berger has an eight-mile haul, but the truck owned by Fred Berger, Junior, covers the distance quickly.

No doubt reader, you are wondering where Mr. Berger sells his cherries. The first few years he sold the crop to private customers. In 1917 he decided to enjoy the many advantages offered to members of "The Door County Fruit Growers Union." While he sells around a hundred crates to private customers, the bulk of his crop now is marketed through the Union. Mr. Berger hauls his cherries to Egg Harbor, where the Union takes them over, looks after the selling, and pays him for them, as it does for the rest of its members. Fruit growers find many advantages in belonging to the Union, which makes every effort to benefit its members. Last year it set a price of two and one-half cents a quart as the price to be paid to pickers. All members were obliged to abide by the rule. This rule was an advantage to fruit growing interests in Door county. Small growers were protected by being able to get pickers, as the rule put a stop to members paying unreasonable prices to pickers in order to monopolize the local help.

Of course, Mr. Berger is well satisfied with the showing his orchard has made. But he expects greater profits from it in future years. To look at this orchard, note the good growth the trees have made, and healthy condition they are in, is to realize that he has good grounds for his expectations. If you were to ask him how he has accomplished his success with cherries; how he has brought his orchard to the high standard it holds, he would be likely to answer with one word—care.

There are other farmers in the vicinity who planted orchards the same time as Mr. Berger planted his. Some of these remain, but many have disappeared, leaving no trace of their existence, but the belief on the part of their owners that a farm orchard is more of a liability than a source of profit.

Mr. Berger, interested in the outcome of these orchards, has seen the reason for their failure. "In every case," he said, "these failures were the result of neglect—the lack of perseverance on the part of the owner. They neglected hiring an extra man when a rush of farm work came on. Instead, they let the orchard go until a more convenient time. No one can expect satisfying results from an orchard where quack grass saps the moisture and fertility from the soil, while disease carries on an offensive against the unsprayed trees. No doubt such cases are the incubators that hatch the sentiment that a farm orchard doesn't pay."

Obviously, Mr. Berger's opinion is entirely different. "Of course," he says, "it may be necessary to hire an extra man for a short period, to handle the additional work an orchard entails. On the other hand, there is sometimes work in the orchard when work is slack on the farm."

Some people may think that Mr. Berger neglected his farm work in order to care for the orchard properly. But such is not the case. He has built up a herd of cows, which, while they are grades, have made him one of the best milk shippers of the community.

When Mr. Berger planted his orchard he knew no more about fruit than most other farmers. Yet his road to success doesn't contain many ruts marked "mistakes." "The nearest I came to making a serious mistake was in pruning," Mr. Berger told me.

This recalls a little incident by which I can tell of the nearness of the mistake Mr. Berger mentioned, and of the size of some of his trees at the same time. While getting the figures showing the costs and profits from his orchard, Mr. Berger was telling me of the size of some of his trees. "Some," he said, "are at least 12 feet high by 20 feet across." Busily writing facts caused me to get the figures turned around. Did you say they were 20 feet high by 12 feet across?" I asked. This of course, caused a hearty laugh. "No," he answered, "I didn't. But I will tell you of a mistake which might of resulted in cherry trees of the pine tree height you mentioned. I didn't know much about pruning when I started the work. Some fellows told me to prune off all the lower limbs, which I did. This would have resulted in getting trees of unguided height. A high tree puts the picker at a disadvantage. However, I noticed my mistake soon enough to remedy it."

Mr. Berger believes the future of the American fruit industry is very bright. He believes every farmer should have an orchard as a source of profit. "If I were twenty years younger I would plant an orchard several times as large as my present one. Although my experience with fruit has been mostly with cherries, I believe there is money in most any kind of fruit, wherever there is a climate and market for it, and farmers have a very good chance to grow a small orchard."

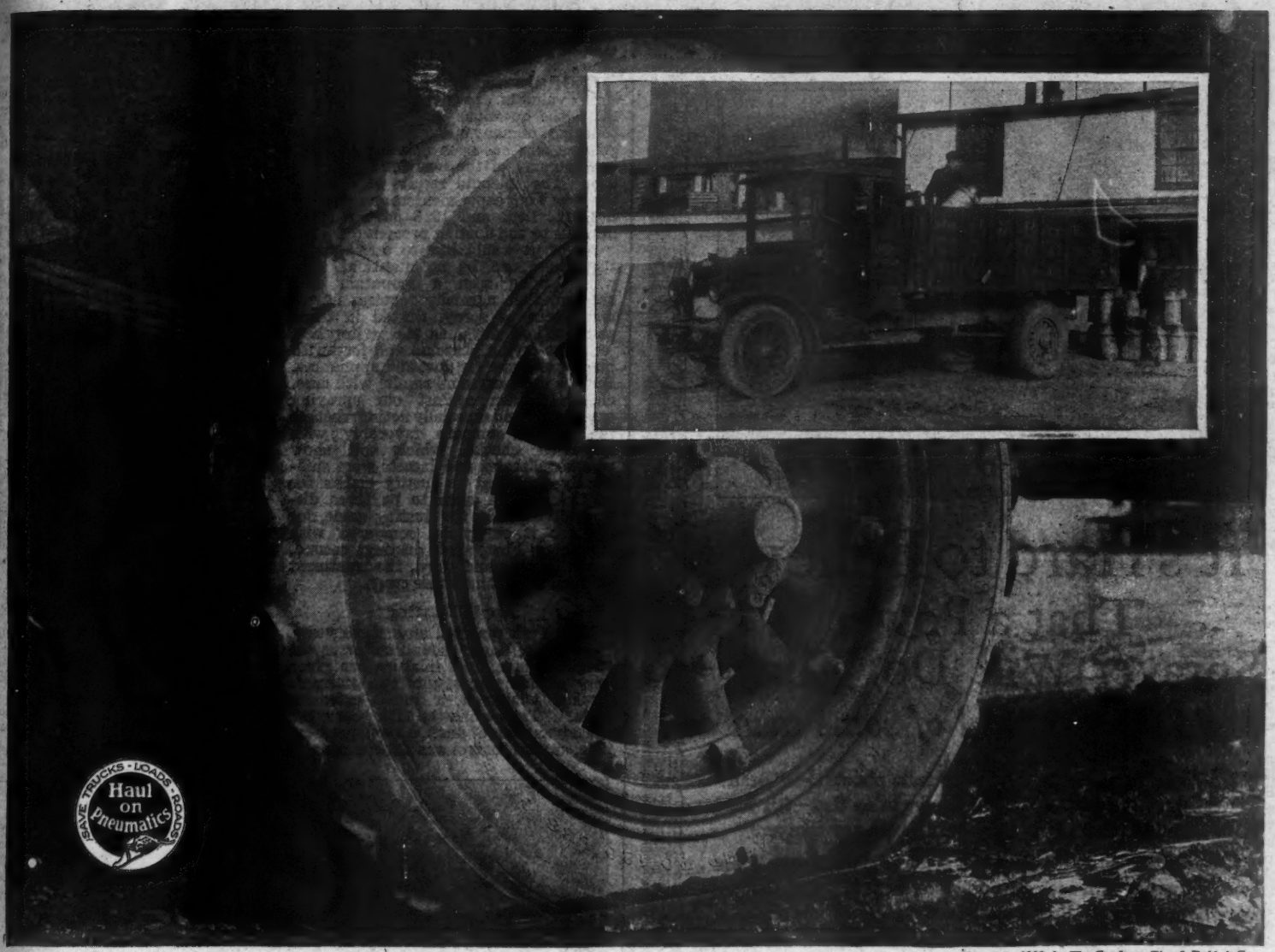
In addition to his cherry orchard, Mr. Berger has a 50 tree plum orchard nearing bearing age, and also a few apple and small fruits orchard.

Here I will end the story of Mr. Berger's success at fruit raising. If it induces some one to plant an orchard, and showing him what an orchard is capable of, it will then have accomplished its mission.

	Expense	Income	Profit
Cost of 1,000 trees	$200.00		
Cost of planting	100.00		
Fourth Year			
Spraying and hoeing	50.00		
Cultivating	50.00		
Fifth Year			
Sold 110 crates of cherries at $1.00		$110.00	
Expenses same as last year	100.00		
Profit for the year			$10.00
Sixth Year			
Sold 750 crates cherries at $1.40		$1,050.00	
Spraying	100.00		
Cultivating	50.00		
Pruning	50.00		
Hoeing	15.00		
Picking at 1¼c a quart	210.00		
Marketing	25.00		
Profit for the year			600.00
Seventh Year			
Sold 300 crates cherries at $2.46		492.00	
Total expenses	450.00		
Profit for the year			42.00
Eighth Year			
Sold 1428 crates cherries at $2.65		3,784.20	
Spraying	100.00		
Cultivating	50.00		
Pruning	50.00		
Hoeing	15.00		
Fertilizer	40.00		
Crates	210.00		
Picking at 40c a crate	571.20		
Profit for the year			2,690.00

SOIL IMPROVEMENT

If the orchard is in closer sod, a mulch of manure will probably not be needed as the clover will furnish the necessary mulch. In regard to the question of whether it will pay to use fertilizers or not, it may be said that most old neglected orchards will respond to the application of manure or commercial fertilizers until they regain their health and vigor. The time for applying is usually very soon after the leaves come out in the spring.



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"IT would be impossible for us to handle our present milk route except with a pneumatic-tired truck. Our Goodyear Cord Tires have delivered mileages up to 13,500 to date over bad gravel, rocks and chuck holes. With them, we serve more farmers than we could with the slow solid tires."—Harry E. Hughes, Dairy Farmer and Truckman, Hughes, Ohio

THIS statement describes hauling conditions such as many farmers find can be counteracted most effectively with the perfected pneumatic truck tire.

Not only does the pneumatic-shod truck, as compared with the solid-tired unit, average a better rate of travel over country routes, without necessarily reaching a high maximum speed, but it does so quite smoothly.

Rural users thus note that hauling on pneumatics adds to a saving of time and brawn important protection of equipment and loads, shrinkable, perishable and breakable.

They particularly note the effect of Goodyear Cord construction, developed during recent years, which makes possible pneumatic-tire mileages comparing very favorably with those of solid tires.

In addition to reporting that pneumatic-tired trucks pave the way for the general motorization of farm work, they list mileages of Goodyear Cord Tires, on trucks, as ranging from 15,000 to past 40,000 when given proper care.

Accurate information furnished by farmers and other rural haulers, showing how they improve their methods and incomes with pneumatic-tired trucks, can be obtained by writing to The Goodyear Tire & Rubber Company, at Akron, Ohio.

GOODYEAR
CORD TIRES

"It's Hard to Believe That a Power Sprayer Will Do That"

—*is the comment of some men*

We have told men the following facts about the "Bean" Power Sprayer who have said, "I'd have to *see* that—it's hard to believe that those things can be done with any sprayer."

We ask you—granting the truth of these statements—if you want a sprayer with such advantages? Bear in mind that we have been building "Bean" sprayers for 36 years continuously.

The Facts Are—

"Bean" Threadless Ball Valves can be removed in two minutes with *engine running* and *300 pounds pressure* on the pump—due to our famous patented Pressure Regulator.

A special plunger stops stuffing box troubles. "Bean" cylinders have *no* stuffing boxes. It is the only pump without them.

The "Bean" has *porcelain-lined* cylinders—smooth as glass—and *absolutely proof* against all harm from any spraying liquid.

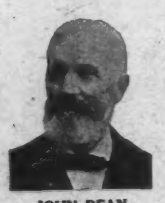
An underneath suction permits washing out valves while open and without stopping engine—a time-saving, easy operation.

The "Bean" engine and pump run slower than others do—saving friction, wear and fuel—yet this outfit throws more liquid with same power than any other that we know.

And there are still other features that must be left to our "Sprayer Book" because we lack space for them here. Get it. Learn all about this wonderful sprayer before you buy a lesser kind.

"Bean" Power Sprayers

Invented by JOHN BEAN



JOHN BEAN
The Inventor

In 1883, John Bean, orchardist and engineer, was fighting San Jose Scale in his California orchard. He designed for this purpose the first high-pressure spray pump with air chamber ever built.

Now the third generation of the family build "Bean" Power Sprayers, and these sprayers lead today as did the first "Bean" sprayer 30 years ago.

These sprayers represent the highest development in power spraying machinery today. We built the first high-pressure spray pump with air chamber ever constructed, in 1883, and we have been improving power sprayers ever since. The "Sprayer Book" tells all about it. Send for your copy now.

Bean Spray Pump Company

30 Hosmer St.,
Lansing, Mich.

302 W. Julian St.,
San Jose, Cal.

BEAN SPRAY PUMP CO.
30 Hosmer St., Lansing, Mich. } Mail to address nearest you.
302 W. Julian St., San Jose, Cal. }
Please send your "Sprayer Book"

Name.....
Street.....
Town..... State.....
Kind of Fruit Grown.....
No of Acres.....

Shall We Dust or Spray?

By Ernest N. Cory

FOR the past four or five years the value of dusting has been one of the questions that has harrassed the minds of many of our prominent fruit growers and has been debated pro and con in many of the horticultural meetings. The splendid results secured by the New York experimenters and growers in 1911, 1912 and 1913 gave a great impetus to the dusting process.

All of us would like to dust—about that there can be no question. One who, having seen a mountain side orchard, that normally requires nearly two weeks to spray, dusted in three and one-half days, as the writer has, feels like crying, Eureka! and forthwith placing an order for dust and appliances. But we must examine results with care, checking them against our spraying experiences and especially noting whether the results compare favorably with untreated checks, which will show whether diseases and insects were sufficiently prevalent to justify claims for control. There seem to be three distinct divisions in the dusting game, for a game it surely is, compared with spraying. First, apple dusting; second, peach dusting and third, the treatment of small fruits and truck crops.

Apple Dusting

New York reported after three years, "the use of finely ground sulfur as the fungicide in a dust mixture has given very encouraging results and warrants further trials on a more extensive scale." Then came the fifth year when the advantages of dusting were questionable, as scab control was not complete.

Scab Was Not Controlled

To further test the efficacy of the dust mixtures an orchard of two varieties was divided into two parts, which were respectively sprayed and dusted. Checks were left in each plot. The past year was certainly one to give the fire test as the worst outbreak of scab, we have ever had occurred. Scab was not controlled, possibly owing to our unfamiliarity with the problem but the spraying showed to advantage over dusting—though the latter was a decided improvement on no treatment.

The figures for this orchard are interesting:

	Dust	Sprayed	Check
Percentage of Insect Injuries	7.75%	6.5%	26.5%
Percentage of Diseased Fruit	27%	16.5%	46%

What is the lesson from the above results? Apparently chewing insects may be controlled quite as well by dust as they are by spray. In the larger acreages where the time element offsets any tendency there might be to use extra care in spraying, it has been the observation of the writer that approximately the same results on insects are secured by either method but in the smaller, more carefully sprayed orchards, it is believed that better results attend spraying.

Diseases apparently are not so easily controlled by dusting and it is a question on a large operation, if he is going to raise fruit for a fancy trade, and in another place, he can better afford to spray."

A Dusting Machine in Operation.

West Virginia reported after four years of experimental work, "it is not felt that the dusting method is to be recommended in West Virginia apple orchards where scab or sooty blotch is severe, or for the treatment of bitter rot, black rot, or blotch, unless it is desired primarily for the control of insects such as codling moth, curculio, canker worm or caterpillar." The Bureau of Entomology confirmed the above results in part and Mr. Siegler reported to the Maryland Horticultural Society that according to the Bureau's experimental data, "a light infestation of the codling moth can be as well controlled by the dust as by the liquid sprays. In orchards where this pest is abundant, the dust has generally proved inferior. Repeated tests by the department and experiment stations have shown that the dust is not an effective agent against apple scab, whereas liquid sprays have given satisfaction. On the other hand, certain dusting experiments from other sources indicate that dust applications compare favorably with the liquid in the prevention of apple scab."

In 1918 Maryland, after having had the dusting operations of some of most progressive growers under observation, conducted limited tests resulting in the following tentative conclusions: On the Eastern Shore the dusting of apple orchards gave in the neighborhood of from 75 per cent to 85 per cent clean fruit, the spraying gave slightly higher, possibly 5 per cent higher, absolutely clean fruit. In view of these results and observations in the mountains, the following recommendations were made: "In the mountain orchards where water is scarce, and hard to haul, and where labor conditions were as bad as they have been in the past year it seems that it is the part of wisdom for a man to dust whether the chance is worth taking. You may get away with it.

What of the cost? Dusting in mountainous sections is certainly cheaper than spraying. One orchard of [illegible] acres showed a decrease in cost per treatment per acre of 73 cents the first year dust was used as compared with spraying the previous year. On the other hand our figures for dusting and spraying level orchards show the cost per application to be less for spraying by $3.60 per acre. The question resolves itself, therefore, into whether your orchards are so situated that the cost will be so much lower, owing to topography and water supply, that you can afford to take the chance of a possible failure to control the pests entirely or being situated on level ground, whether you want to risk failure, at an added cost, simply to get away from the difficulties and labor attendant on careful spraying—"You pay your money and take your choice."

Peach Dusting

The West Virginia Station has reported that "since the sulfur dust was found quite effective against peach scab and brown rot, it is believed that the method may be found of much practical value in the peach orchard." Also that "the dust materials have given just as good results as standard spray materials in the control of peach diseases." New Jersey growers have used the dust method to excellent advantage on peach. Some defoliation attended the early tests but their control of scab and curculio has been excellent. Maryland in 1918 reporting on a dusting experiment on the Eastern Shore showed that the dusting cost was approximately twice that for spraying and the results were less favorable for the dusting. The

(Continued on page 30)

MIDWEST UTILITOR

TRADE MARK

DEPENDABLE POWER

The multitude of practical ways the Midwest Utilitor can be used is astounding farmers and food raisers the world over.

And every day is discovering new uses for the Utilitor. It is literally making over the whole popular conception of profitable soil cultivation.

The Utilitor is both a small tractor and a 4 horse-power portable gas engine. It does the field work of one horse or mule, goes from chore to chore on its own power, never tires and operates for five cents an hour.

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MIDWEST ENGINE COMPANY - - - Indianapolis, U. S. A.

Note carefully the air-cleaner attached to the Utilitor. This air-cleaner is designed especially for this machine—has proven 95% efficient on test—and comes as regular equipment only on the Utilitor. The air must first pass through a moist sponge before it reaches the carburetor. The sponge automatically is kept moist by water in the glass tank. The glass tank is its own indicator of the amount of water available. No need to purchase a so-called air-cleaner or "Humidifier" with this machine. All chance of faulty operation due to dust or grit entering the engine has been eliminated. Carbon is prevented and power increased.

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Dependable Power

You Can Avoid Wormy Apples

and produce satin finish fruit by using

ORCHARD BRAND
Arsenate of Lead
in combination with

B.T.S. or Atomic Sulphur

Let our experts tell you how to control

Codling Moth, Curculio, Canker Worm, Apple Blotch, Leaf Spot, Brown Rot, Bitter Rot and Blotch, by spraying.

Orchard Brand B. T. S. is a dry product, with no leakage or wastage, less bulk and more easily handled than Lime Sulphur Solution. You have less freight to pay and will find it more satisfactory in every way. A 100-lb. keg of B. T. S. is the equivalent in all spraying operations of a 50-gallon barrel of Lime Sulphur Solution weighing about 600 lbs. *Orchard Brand Atomic Sulphur* is a highly efficient fungicide for the control of apple scab, brown rot of peaches and other stone fruits, apple mildew and rust diseases.

FREE SERVICE BUREAU

We are cooperating with fruit growers everywhere. Put your spraying problems up to us. Correspondence is invited. Our advice and directions are given free. Write us direct. We answer spraying inquiries personally. Get your name on our mailing list to receive the seasonable spraying pointers and information we are sending out. Address as below.

General Chemical Co.
Insecticide Dept. 25 Broad St. New York

A Successful Berry Association

By Harry Bangs, Missouri

WITHIN a sixteen-mile radius of Anderson, McDonald county, Missouri, is one of the most practical and successful fruit shippers' co-operative associations in the country. It was founded about 1903 or 1904 by N. W. Roark, one of the pioneer settlers of this county, together with two or three of his neighbors. After demonstrating to their entire satisfaction that the strawberry was especially adapted to this section of the country, they conceived the idea that they could organize themselves into an association on a co-operative basis and produce and handle berries in a large way and make a better profit than if they acted independently.

Harvesting Strawberries in Chapman Brothers' Field Near Anderson

With this idea in view, they proceeded to organize the institution, which today stands second to none so far as success is concerned. The association still operates on the same basis, and under the same constitution and bylaws as were first adopted. The officers are president, vice-president, secretary, treasurer and business manager. There is also an executive committee consisting of five members, three of whom are elected by the association, with the president and secretary as ex-officio members. Regular meetings of the executive committee are held once a month. All officers hold for one year. The duty of the executive committee, or business committee as it is commonly called, is to act upon business that comes up in the rush season and which requires prompt attention.

Buyers Come and Stay

For the first few years the association consigned all of its fruit to commission men. But for the last six or seven years the quality and quantity of Anderson berries have become so well known that from three to six buyers of established credit come to Anderson at the beginning of the season, about May 15, and stay until the season closes, usually about June 20. They buy the fruit on track.

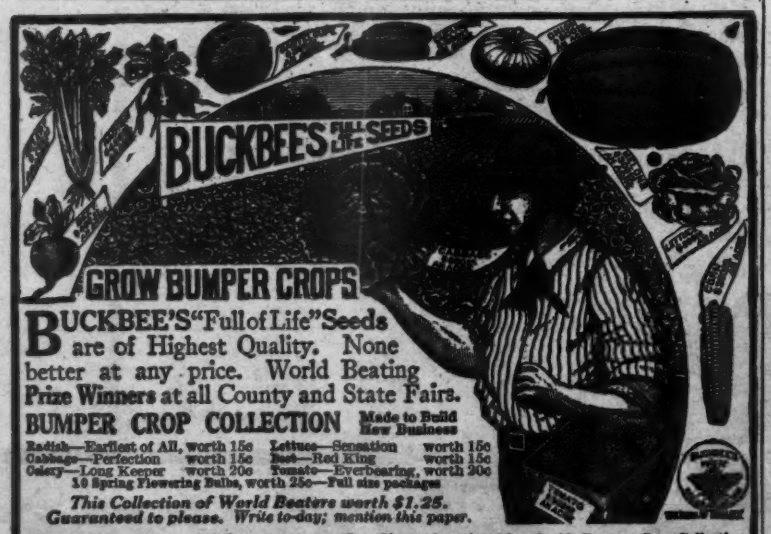
By this system the growers' money is in the hands of the business manager before the fruit leaves the shipping shed. The growers know every day what the sales have been and the price received. The motto of the association is, and always has been "a full box and quality pack." We have two grades of berries, the first or "A" grade, and the second or "B" grade. Any crate of berries that passes inspection as a second or "B" grade sells for one-fourth less price than the fruit of the better grade. When a grower sells on the season's average at $6 a crate, as they did here this year, it doesn't take long to convince the grower that it pays to put up a first-class pack.

The association now has about 325 active members, and the acreage operated by them is approximately 400. The shipment for the season of 1919 was 107 cars, with gross receipts amounting to $286,512.69, making the output average $6 a crate for the season. From this figure, there was, of course, a shipping expense which amounted to six cents a crate, and a harvesting expense of about $1.20 a crate, leaving the grower an average net profit of $4.74 a crate for his trouble and risk.

The business manager of the association buys the crates for the whole body, which of course assures the grower of getting his stock at the very best prices, terms and freight rates. We use the 24-quart dry measure crate. All of the more extensive growers use tents for the accommodation of their pickers. These tents are leased from reputable tent and tarpaulin houses in nearby cities for very reasonable sums. When a grower receives tents, he is charged with them and given credit when they are returned in good condition to the business manager of the association.

This past season 2½ cents a quart

(*Continued on page 60*)



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BUCKBEE'S "Full of Life" Seeds are of Highest Quality. None better at any price. World Beating Prize Winners at all County and State Fairs.

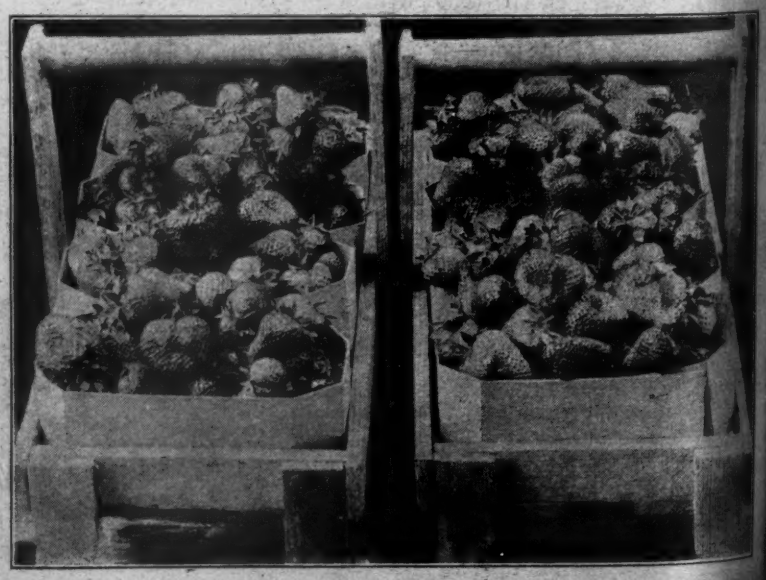
BUMPER CROP COLLECTION Made to Build New Business

Radish—Earliest of All, worth 15c
Cabbage—Perfection worth 15c
Celery—Long Keeper worth 20c
Lettuce—Sensation worth 15c
Beet—Red King worth 15c
Tomato—Everbearing, worth 20c
10 Spring Flowering Bulbs, worth 25c—Full size packages

This Collection of World Beaters worth $1.25. Guaranteed to please. Write to-day; mention this paper.

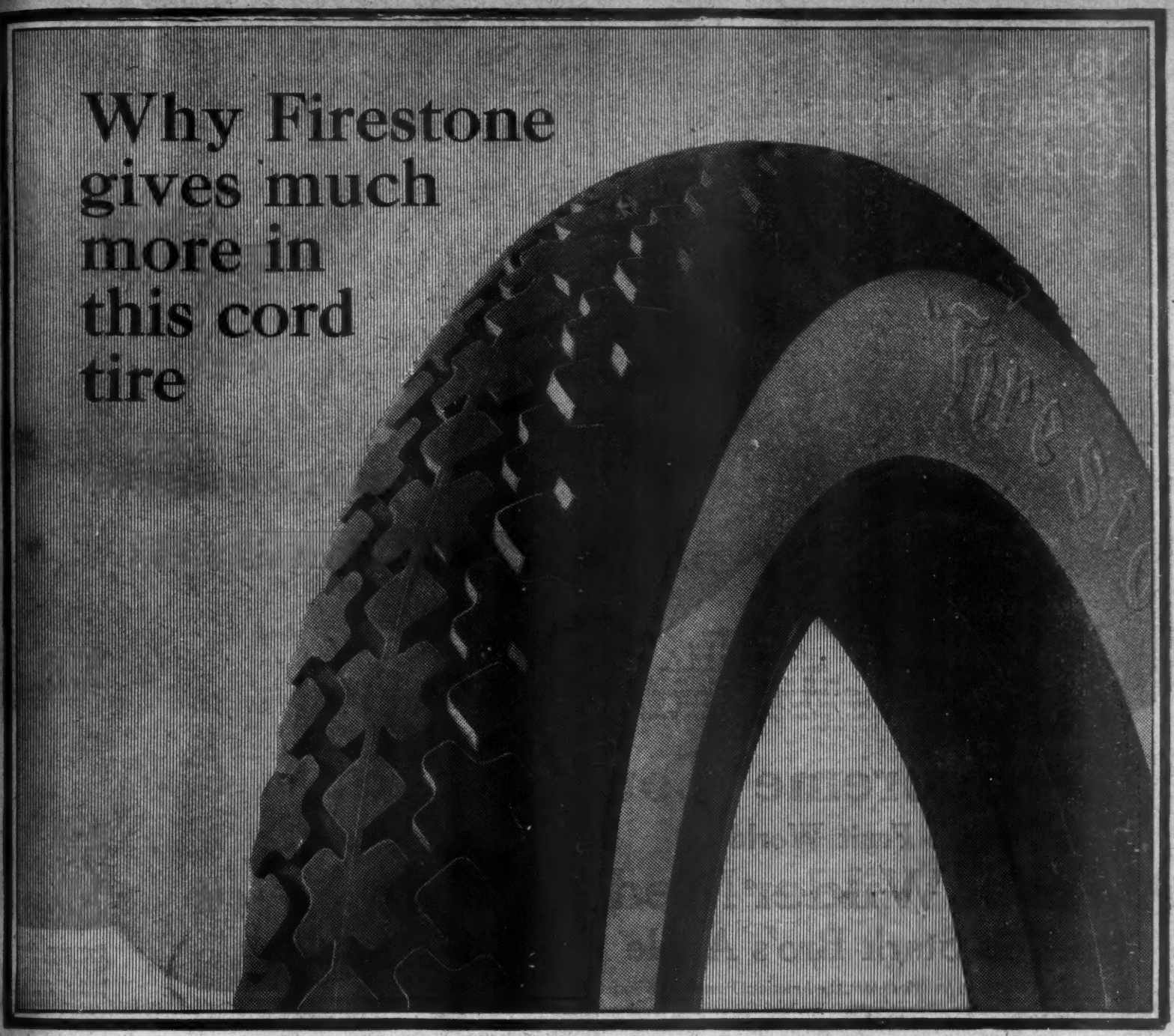
SEND 10c to help pay postage and packing and receive this valuable Bumper Crop Collection of Seeds, postpaid, together with our big, instructive, beautiful Seed and Plant Book. Tells all about Buckbee's Famous "Full of Life" Seeds, Plants, Bulbs, etc.

H. W. BUCKBEE ROCKFORD SEED FARMS FARM 614 ROCKFORD, ILLINOIS



Type of Carrier Used By the Berry Pickers

Why Firestone gives much more in this cord tire



Most Miles per Dollar

THE dealers say there is no argument—the Firestone Cord, compared side by side with any other, sells itself.

No wonder. It is built to the largest standard oversize of the industry.

It has much greater air capacity than the average. It contains much more material and it delivers extra mileage in proportion. The thicker, heavier tread, that looks and feels the part of its extra mileage, is another reason why it sells itself.

And that tread is as good as it looks from the standpoint of preventing skid, slide or spinning of wheels. It has a tractive power never before equaled in a rubber tread, yet it has no inclosed hollows or suction features to be a drag on speed or a drain on power.

Specify Firestones; your dealer is ready with just your size—Cord or Fabric.

FIRESTONE TIRE & RUBBER CO.
FIRESTONE PARK AKRON, OHIO
Branches and Dealers Everywhere

Firestone

The above shows part of a photo of an 18-months-old top graft of Stark's Golden Delicious—bearing in 1916 in Central West. An extra heavy crop of big, golden, super-quality apples—much larger and finer flavored than Grimes Golden. It bore again in 1917, 1918 and 1919. Absolutely a World's Record for young and heavy bearing.

"The Supreme Court of the Fruit World" Awards Wilder Medal to This Stark Bro's Apple

What the Supreme Court is to American law, the American Pomological Society is to American fruit and horticulture. For 75 years it has been the unquestioned authority on all questions pertaining to fruit and horticulture on the western hemisphere. At its 1920 meeting this Society gave to the Golden Delicious the highest tribute ever bestowed upon an apple—the *only* Wilder Silver Medal (see cut of same below) that has ever, with one exception, been granted to an apple during the last 35 years. The Silver Medal is the greatest medal given by the Society. This means that the ***American Pomological Society gives its highest award*** to our Golden Delicious. And when this authoritative body has thus placed its official stamp of approval on this apple, it assures you that this golden apple is a truly great fruit achievement—one worthy of your confidence—your purchase—your planting for profit and pleasure.

Photo above shows Stark's Golden Delicious, actual size. Prof. Cooper, State Horticulturist, Arkansas, who was present at the meeting of the American Pomological Society, said that the 14 Stark's Golden Delicious apples that his tree bore last year (second year after planting) were about as large as these big beauties shown above.

The Wilder Medal is the Nobel prize of the fruit world. It was provided for by a Trust Fund left in 1886 by the late Marshall P. Wilder, Scientist and Pomologist, who was President of the American Pomological Society for 38 years—with instructions that it was to be awarded to a fruit only after exhaustive investigation had produced proof of that fruit's supreme merit.

Send Coupon for this FREE BOOK

Stark's Golden Delicious

STARK TREES BEAR FRUIT

STARK TREES Reg. U. S. Pat. Office

We're Planting Thousands

of Stark's Golden Delicious trees in our own personal orchards. *That* shows what *we* think of it!

We are doing this because, like J. L. Webster, the well-known Wenatchee (Wash.) grower, we *know* that *"Stark's Golden Delicious is a strong grower and heavy bearer.* Its apples do not drop off. Keeping quality equal to old Winesap. Eating quality equal to Stark Delicious. It will surely excel in the world's apple markets."

Send Your Name and Address On the Coupon or a postcard—for Free copy of our 1920 Year Book—"Prize Fruits"—giving the full particulars about this apple and all Stark Bro's fruits.

The Famous $5,000.00 Apple

We discovered the original Stark's Golden Delicious tree years ago flourishing and bearing bumper crops of finest apples, on a barren West Virginia mountainside. We immediately bought this remarkable tree for $5,000.00—the highest price ever paid for a single tree—and have for years propagatedyoung Stark's Golden Delicious trees from "the wood" of this original tree. The apples they bear are easily the finest yellow apples we have ever seen or eaten in all our 104 years of nursery and orcharding history. Superior to even Grimes Golden in appearance, size, flavor and quality. Keeps 4 months longer. Fills the Grimes Golden demand long after that apple has rotted and gone from the markets. Shrewd fruit raisers all across America have watched it in the years of its orchard testing—and, noting its remarkable tree and fruit superiorities, are now planting these trees by the thousands. You will profit by doing likewise.

Stark Bro's Nurseries, Box 289, Louisiana, Mo.
Send me your 1920 Free Year Book—"Prize Fruits"—at once.
☐ If you also want our Free Book, "Secrets of Ornamental Planting," and information about Free Landscape Plans check ☐ square to left.
I may want.....trees this spring.
Name.....
Street or R. F. No.....
Post Office.....
State.....

STARK BRO'S White **NURSERIES** Model
The Only Stark Nursery in Existence—at LOUISIANA, MO., Since 1816

Orchard Problems and Their Solution

By Paul C. Stark, Associate Editor

This department is intended to be of service particularly to the beginner in fruit growing, and to aid him in a better understanding of the principles of fruit growing. Every grower, big or little, young or old, is occasionally confronted by problems that are confusing. Let us help you in solving those problems. Address, Paul C. Stark, Associate Editor, AMERICAN FRUIT GROWER, Chicago, Ill. Such questions as are of general interest will be answered through these columns; others will be answered direct by mail.

Lime in Orchard

Q.—I wish to ask the following questions concerning lime for apple orchards. I have heard that the application of lime increased the life and health of the trees and that it improves the flavor of the fruit making it sweeter. Our soil will turn the color of blue litmus paper quite pale or light colored.

W. A., Wis.

A.—Lime is not what could properly be called a fertilizer, but it has a very beneficial effect on many soils; particularly, where they tend to be acid. Your litmus paper test indicates acidity although a pink or light red color would be more definite. However, you can't go wrong in using lime and you will, I feel sure, find a very beneficial effect on your trees. Your trees will grow better and your fruit will be larger and finer, although the fruit will not be made sweeter, except that it will produce finer specimens. I am applying lime to my orchard this winter. I am using the ordinary ground rock limestone which is slower in producing results but lasts longer than the hydrated lime. Don't be afraid to use lime—I know orchardists who use many carloads of it every year. Lime and manure is a combination that is hard to beat.

Pruning Old Peach Trees

Q.—(1) Peach orchards range from 4 to 15 years of age. Older trees are too rank to plow between and are needing cultivation badly. Would you advise to pull every other row and grow an intercrop between the remainder? (2) Should a ten-year-old peach orchard be cut severely, or only the dead wood and a few inside branches be removed?

B. B., Pa.

A.—(1) Wherever your trees are crowding, I would advise you to thin out so you can cultivate. Remember that the roots are interfering just as much as the tops. Don't grow your intercrops too close to your trees. Intercrops are all right in young orchards before they are bearing, but after the trees begin to bear, the trees need all the plant food. (2) Without more data about your trees, I cannot advise you definitely, however bear in mind that peach trees should be kept pruned regularly by heading in and thus keeping the heads low. The peach tree bears its fruit on the one year wood and if the limbs are not headed back regularly, the bearing wood will get higher and higher, thus making picking, spraying, etc., more expensive. Keep the dead wood cut out, also keep the head opened and the superfluous branches thinned out.

Peach Orchard Soil

Q.—Have just purchased a farm with 1,100 five-year-old peach trees. The trees appear healthy but are small for their age. They produced over 100 bushels of very good peaches this year and a great many orchards were a total failure on account of the late freeze. The land is a clay hillside and somewhat washy. The orchard has had no tillage for the last two years. I expect to sow to cover crops to turn under in the spring. What would you advise to sow? What fertilizer if any, would you use, and how much? When should I spray and what should I use? C. E. D., Ohio.

A.—Your peach trees if properly cared for, can be made very profitable. You have the right idea in sowing cover crops—they will help to stop washing and will add plant food and humus to your soil. If you can get barnyard manure or stock yard manure, put it around the trees this winter, then cultivate your trees next spring. Your trees would be benefited by an application early next spring of nitrate of soda to strengthen the growth. Cowpeas are splendid for cover crops, although they do best in the south. In the north, soy beans are used more. There are a number of other cover crops but the legumes (such as cowpeas, clover or soy beans) will add a large quantity of nitrogen to the soil. Give your orchard regular cultivation—cultivate after the rains to break up the crust and thus retain the moisture in the soil.

Spray your trees with lime sulphur this spring before the leaves appear, then after the leaves come, spray with self-boiled lime-sulphur 8–8–50 and arsenate of lead. If you want full directions, write us for a booklet on the subject. Don't neglect your trees—they are capable of making a lot of money for you—but you must do your part.

Holes in Peaches

Q.—I have the Wild Goose plum. They have always been so large and smooth until this year. They were small and half of them had wormholes in them. What can I do in the way of fertilizing for next year?

C. V. I., Colo.

A.—The worm holes are the work of the plum curculio, which you can poison by spraying with arsenate of lead, 2½ pounds to 50 gallons of water. It can be mixed with regular self-boiled lime-sulphur 8–8–50 and applied at the same time.

An Early Black Grape

Q.—Do you know of any shipping grape ten days or two weeks earlier than Moores Early? C. L. W., Mo.

A.—In regard to an earlier grape than Moore Early, I believe you should consider Eclipse. U. P. Hedrick, in the report of the New York Experiment Station, says, "It is a seedling of Niagara and therefore, a grandchild of Concord, which it resembles, differing chiefly in being earlier and of much better quality. The vines are hardly surpassed by those of any other variety, being hardy, healthy and productive—qualities that should recommend it for commercial vineyards. The ripe fruit hangs on the vines for some time without deterioration and the grapes do not crack in wet weather. It should make a splendid forerunner for Concord." I have fruited it in my own vineyard and it is sweet and good, long ahead of Moore Early.

When Is Time to Prune?

Q.—Will you kindly tell me the right time to trim young apple and pear trees? Last year I set out ten choice apple trees and several pear trees and since then I have asked several men when to trim them. But I know there is a right time and I am anxious to find out. Also, may I ask about the spray? When should it be done, how often and what do you recommend as the best spray for young fruit trees?—F. H. S., Pa.

The best time to prune your young fruit trees is during mild days of early spring before growth starts. We are sending you a little booklet on pruning and spraying under separate cover.

Read the article on page five of our January issue. Other articles on pruning will appear from time to time, and if you have any questions to ask about any of them please let us hear from you.

Early Apples

Q.—Do you think the Liveland apple is sufficiently self-fertile to use, setting a large block alone? What do you think of the Yellow Transparent and Wilson Red June as a shipping proposition here? Both varieties do well here, but I am uncertain how they would take on the market. What do you think of the claim being made that "Scalecide" will cure blight? About how would the cost compare with that of lime-sulphur?—C. R. S., Okla.

A.—The Liveland Raspberry will bear in solid blocks but like other varieties, it will not bear as well as when planted so it inter-pollinates well. I prefer planting four rows of one variety, then four rows of another variety. Some orchardists plant in eight row units. In favorable years there will not be the necessity for cross pollination, but in unfavorable years when there is much rainy weather during the blooming season, it may make a big difference in the size of the crop.

Liveland Raspberry, Yellow Transparent and Wilson Red June are all proven commercial apples and they take well on the markets. They bring big prices on the markets and you can plant them with confidence.

In regard to scalecide, this is very efficient in controlling scale insects. I have not personally had experience with the control of blight with Scalecide, but I have talked with orchard men and some experiment station men who have secured some results along that line. If used correctly, it won't do any harm and if it controls the blight it will be of great value. If I had blight badly in my own orchard, I would give Scalecide a chance to control it. It is more expensive than lime-sulphur, but it has greater spreading powers and for this reason the manufacturers claim it is as cheap as lime-sulphur in the end.

The J. H. Hale Peach

Q.—I read your article in the December issue from the Hudson River Hale peach grower. He takes the cake for size. I want to give you my experience with the J. H. Hale, which may interest some of your readers. On my Alabama peach farm I have one J. H. Hale from which I have been taking buds, that was set out four years ago. The past year it bore its first crop, which was thoroughly sprayed after the blossoms had fallen and again three weeks before ripening. It set a very heavy crop of which I thinned out about half but still it was so full that it had to be propped all around. Consequently the peaches were not large but the following is what appealed to me as I have been shipping Elbertas in car lots to Northern Markets with rather unsatisfactory results as to conditions of the fruit on arrival. This year I went down to the farm on July 18 and found the fruit on the Hale tree most beautifully colored and would have done very well to ship at that time. But I wanted to test their keeping qualities so left them on the tree, except for a few for eating, until I left the farm for home on the 12th day of August at which time but few of them had fallen, and but a small per cent had rotted. Those on the tree were almost firm enough to ship but few of them being soft on the stem end. On coming home I brought some specimens with me, laid them on the mantle and they remained a full week without rotting. They seemed inclined to dry up instead of rotting.

In my young J. H. Hale orchard that was not sprayed my experience was quite different. This was their first bearing, and but few peaches, the largest about 11½ inches in circumference. But they nearly all rotted before fully ripe. I think this was for lack of spraying and insufficient pruning. In conclusion will say that it is my opinion the J. H. Hale is destined to become the leading commercial peach of the future.

A.—Your experience is interesting. In my experience, I have found the J. H. Hale a better keeper and shipper than Elberta. The rotting on the young trees was undoubtedly due to lack of spraying. Brown rot can be controlled by spraying, but the man who doesn't spray will lose much of his fruit. Often unsprayed peaches look all right at shipping time, but in transit they start to rot. Spray regularly and spray thoroughly.

HOW DO YOU STOP THEM?

A number of inquiries are being received asking about the control of rabbits in young orchards. In an early issue we want to have a symposium of experiences on rabbit control. Write out your experiences in a few short sentences and send it in. Tell us how you control the rabbits in your orchard. If you paint the tree trunks, what do you use? If you use wrappers of any kind, what is the expense per tree? Do you find wrappers to be better than paint?

One subscriber asks about a mixture containing one bushel of air slaked lime, one-half pound of asafoetida and one pound of barbadose aloes with enough water to make a paint. He wants to hear from someone who has tried this particular mixture. If you have ever used it, please tell us your experience with it. Let us have a goodly number of reports on rabbit protection in young orchards.

Growing Orchards and Kiddies is a Good Combination

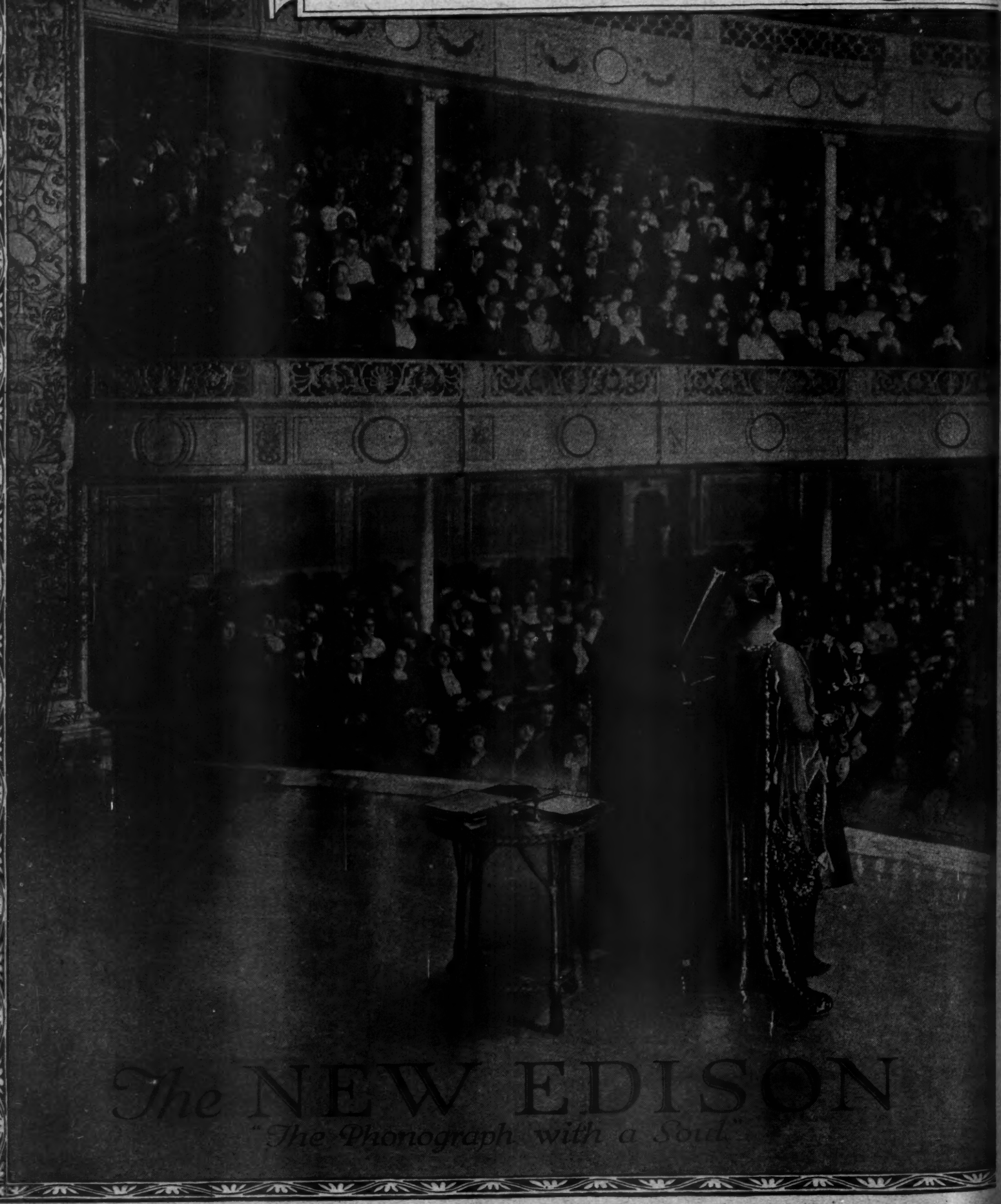
He Has Made a Success of His Orchard

So Mr. Charles C. Bowman of Mt. Jackson, Va., believes, for he has a fine orchard and eight children.

Mr. Bowman's orchard is from eight to fifteen years old. Varieties are Stayman, Paragon, Delicious, York, Black Ben. Mr. Bowman says that he would not take $1000.00 per acre for his orchard. His orchard brings him a profitable crop each year and he does not care to take chances on some new venture. Mr. Bowman started a few years ago with no capital and today his orchard represents a good fortune. By using intercrops in his orchard he brought the orchard into bearing and made a good living while he was doing it. He has a nice home, with running water, electric lights, furnace, and other modern conveniences.

The California State Nursery Association has formed a co-operative organization to establish a $100,000 nursery budding plant for the propagation of pedigreed nursery stock. Fruit growers, canneries and associations of producers contributed very promptly and generously, being interested in the purpose of the plan which is the improvement of nursery stock and increase in orchard production.

All Pittsburgh



The NEW EDISON

"The Phonograph with a Soul"

Was Amazed!

(From The Pittsburgh Leader)

Rappold and Laurenti Entertain Big Audience At Carnegie Music Hall

The tones which came from the New Edison phonograph matched those from the living artist so perfectly that it was impossible to detect any difference. The instrument produced not an echo or copy, but the real thing—the voices of Mme. Rappold and Mr. Mario Laurenti, untainted by any mechanical transformations, unspoiled by any metallic ring.

(From The Pittsburgh Gazette-Times)

Record Reproduces Voice Accurately

Demonstration Given in Carnegie Music Hall with Edison Phonograph

A demonstration of the exactness with which the human voice may be reproduced on a phonograph record was given last night in Carnegie Music Hall with the new Edison machine.

Several selections were sung personally by Mme. Marie Rappold, celebrated soprano, and Mario Laurenti, baritone of the Metropolitan Opera Co. Simultaneously the same selections were produced on the phonograph, and with a subdued lighting effect, it was impossible to distinguish the actual voices from the reproduction.

(From The Pittsburgh Chronicle-Telegraph)

Phonograph Reproduction Rivals Voice

...ingers

...e Hall a ...ne new ...sound ...nd the ...g the ...ucing ...can- ...al. ...tts- ...ues

(From The Pittsburgh Dispatch)

Miracle Songs Create Furore

Concert in Carnegie Music Hall Astonished Big Pittsburg Audience

This proof was convincing. If it were not, another proof was offered. After Mme. Rappold had commenced to sing one number the lights were turned out—ostensibly so that the audience could not watch the singer's lips.

It did not seem difficult to determine in the dark when the singer sang and when she did not. The writer himself was pretty sure about it until the lights were turned on again and it was discovered that Mme. Rappold was not on the stage at all and that the New Edison alone had been heard.

(From The Pittsburg Sun)

Singers and Music Boxes in Concert

Vocal and Metallic Tones Unable to Be Distinguished

A unique concert was given last evening in Carnegie Music Hall in which Mme. Marie Rappold, well-known American soprano, and Mario Laurenti, noted young Italian baritone, took part. The audience heard not one Mme. Rappold and one Mr. Laurenti, but two, the phenomenon being accomplished by means of a cabinet which stood on the stage beside the performers and matched their performance, note for note and tone for tone.

(From The Pittsburgh Post)

RECORDS VIE WITH SINGERS IN OWN SONGS

Madame Rappold and Laurenti in "Miracle Concert."

Madame Rappold sang the initial number on the program. In the midst of it her lips ceased to move but the song went on. Slowly it dawned on the astonished audience that the artist was no longer singing, though her voice came forth to them as clearly and sweetly as before. Again she sang, and the audience only knew it was the living Madame Rappold, because of the motion of her lips. Her lips ceased to move—but her voice continued. The same magical effect was obtained when Mr. Laurenti sang.

CARNEGIE HALL, Pittsburgh, was jammed to its exits on the night of September 30, 1919. The audience was made up of 2600 music-lovers and music-critics. They came to hear Marie Rappold and Mario Laurenti make a remarkable comparison with the New Edison's RE-CREATION of their voices. Read what the Pittsburgh newspapers said—see what happened. All Pittsburgh was amazed. There was no difference between the voices of the living artist and its RE-CREATION by the New Edison.

3000 such audiences have heard similar tone-tests given by forty different artists of international fame. Always the result has been a triumph for the New Edison.

The story of Edison's RE-CREATION of Music is told in an interesting new book, "Edison and Music." Write for it. Thomas A. Edison, Inc., Orange, N. J.

Illustration from an actual photograph taken in Carnegie Hall, Pittsburgh, Sept. 30, 1919.

DON'T Throw away your Dollars
buy a
MYERS
"HONOR-BILT"
SPRAY
PUMP
MYERS COMPLETE BARREL OUTFIT
MYERS HANDY SPRAY OUTFIT
PATENTED COG-GEAR
PANAMA
PNEUMATIC
MYERS O.K. BARREL SPRAY PUMP
REFILL
This is the year of
years to prevent loss through care-
lessness, use of poor materials, or cheap equipment.
In spraying your orchards, trees and gardens, don't fool with experiments, untried theories or impractical construction. Failure and disappointment often result and your pocket book suffers.
Buy MYERS "Honor-Bilt" SPRAY PUMPS and ACCESSORIES—standard for fifty years—and place your spraying operations on a scientific basis. Economy, ease of operation, uniform application of mixtures, fast service, better fittings, are known qualities of MYERS SPRAY PUMPS—They have made the name MYERS synonymous with better spraying and have made MYERS SPRAY PUMPS favorites with the largest producers of fruits and vegetables in the world.
MYERS SPRAY PUMPS and ACCESSORIES — for Hand or Power — come in so many styles and sizes that it requires a 64 page Catalog to illustrate and describe them, and—the 1930 Edition is now ready for distribution. Write for your copy today and spray MYERS WAY for bigger and better crops and accompanying profits.
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NO. 150 ORANGE ST. ASHLAND, OHIO.
MYERS AUTOMATIC POWER PUMP
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Destroy the fungi and worms, and thus be sure of large yields of perfect fruit.
Excelsior Spraying Outfits and Prepared Mixtures
are used in large orchards and highly endorsed by successful growers. Write for our money-saving catalog, which also contains a full treatise on spraying Fruit and Vegetable crops.
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That was the result of a five-year experiment conducted by The Ge eva, New York Horticultural Experiment Station, to test the value of orchard cultivation.
Forkner Orchard Cultivator
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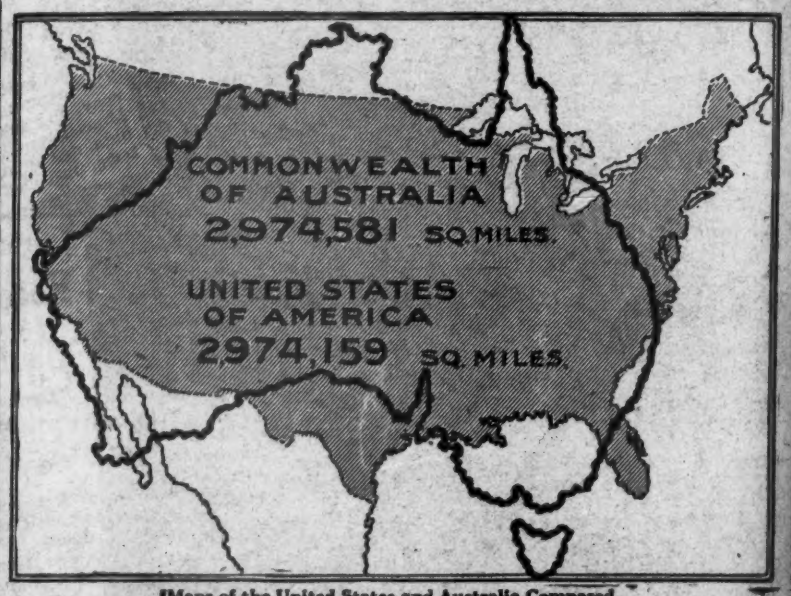
CULTIVATES UNDER LOW BRANCHES
The broad extension gan s extend out of the path of the team—low enough to reach under the lowest branches. It leaves a surface free from ditches and ridges—does not throw up bank around trees. Your orchards will pay bigger profits if you use a Forkner. Write for our catalog. Also our free book "Forkner Improved Method of Orchard Tillage."
THE LIGHT DRAFT HARROW COMPANY
641 Nevada Street Marshalltown, Iowa

Fruit Growing in Australasia

By R. E. Boardman

THE huge size of the Australian continent is not readily grasped. As a matter of fact Australia has an area of 2,974,581 square miles; being larger than the United States of America by some 422 square miles. In addition New Zealand has an area of 104,751 square miles. Stated in another way, the area of Australia is greater than that of the United States of America; is four-fifths the size of Canada; is nearly one-fourth of the area of the whole of the British Empire; is nearly three-fourths of the whole area of Europe; and is 25 times as large as Great Britain, or Italy.

The population is but a handful—5,000,000 souls. These figures need to be taken into account when considering the problems of developing this marvelously fertile land.



[Maps of the United States and Australia Compared.

Less than half of the continent of Australia is in the tropics. Tropical Australia is about one-half of the states of Queensland, Western Australia, and the Northern Territory, and comprises 1,149,320 square miles, leaving a balance of 1,825,261 in the temperate zone. Australia has a coast line of 12,210 miles, an average of 244 square miles for one mile of coast line.

By reason of its insular geographical position and the absence of striking physical features, Australia is on the whole less subject to extremes of weather than are regions of similar area in other parts of the globe; and latitude for latitude, Australia is on the whole more temperate.

Soldiers Become Fruit Growers

There are 323,081 acres under fruit and vines in the Commonwealth of Australia and 35,000 acres of fruit in the adjacent Dominion of New Zealand. This area is being rapidly increased because of heavy plantings by the Returned Soldiers' Branch of the New South Wales Government, which is placing over 2,500 ex-soldiers on fruit-growing areas of some 50,000 acres. The Victorian Government is also carrying on an active settlement policy on its fruit-growing lands in the Irrigation areas of Northern Victoria.

Australia produces very many kinds of fruit in abundance, including apples, pears, peaches, plums, prunes, apricots, cherries, grapes, lemons, oranges, limes, grapefruit; and small fruits such as strawberries, gooseberries, raspberries, loganberries, black and red currants. In the tropical areas, we grow pineapples, bananas, mangoes, guavas, papaws, granadillas, etc.

Prohibition of American Arsenate of Lead

An order has been issued by the Federal Minister of Trade and Customs prohibiting the importation of arsenate of lead into Australia, except under license. This does not apply to stocks on the water. Doubtless the Australian representatives of American manufacturers of arsenate of lead will secure the necessary licenses, though these can be cancelled by the whim of an official. Prior to this prohibition, the rumor was current that Australian manufacturers were pushing for a higher duty on imported arsenates, and fruit growers throughout the Commonwealth made vigorous protest. The customs department promised that the representations made by the growers would receive consideration before the tariff was revised, but as is often the case in such matters some "back door" methods have been used, and the growers have not been consulted before the Order for prohibition was made. This follows on a similar high handed action by the same official in prohibiting sheep dip, thus shutting out some established and highly appreciated English dips, against which Australian farmers have protested so strongly that the embargo, we hope, will shortly be lifted. This embargo united the farmers more effectively than years of ordinary organizing methods. Fruit growers similarly are vigorously protesting against the prohibition of imported arsenates.

Four years ago the American article was 10d. (20 cents) per pound on the Australian market, but the increased costs of chemicals, manufacture, freight, etc., have caused the rise in prices. American arsenate is appreciated here; it is hoped that soon prices will be reduced, and that the foolish embargo will be lifted. The embargo will apply to Australian only, and not to New Zealand.

It is as well for American manufacturers of spraying mixtures to know what is happening here, for it may be they can strengthen the hands of their Australian representatives, and also the fruit growers in their just protest.

The Rise of the Tractor

Enterprising American firms through their Australian houses have been giving demonstrations on government experiment farms and on ordinary orchards and farms showing the utility of the tractor. They have been warmly welcomed. Those fruit growers who have purchased tractors are finding them extremely valuable, and the opinion is expressed that more will be used as their advantages become known.

One orchardist in New South Wales, Mr. L. Sim, of Capertee, who purchased a tractor is enthusiastic. He states it does the work of five horses and three men. Land can be plowed at the rate of one acre per hour, using, in light soil, a six-furrow disc, the fuel consumption being three-quarters of a gallon of petrol or a lesser quantity of kerosene. The tractor can also be used for cutting chaff, pumping water, hauling logs and sawing wood. The tractor is a Track Pull Bean, weight 30 cwt., horse-power, is 16 on the engine, 10 h. p. on the pulley and six h. p. on the drawbar.

(Continued on page 70)

GMC

General Motors Trucks

SOONER or later you expect to get a motor truck for all-around farm use.

The GMC Model 16 is America's standard all-purpose truck.

It was standardized by the government for all military work in the ¾ to 1 ton class. Any American soldier in the late war can tell you of its record.

We have yet to find the first dissatisfied user of a GMC Model 16.

It has all the speed you want—will carry its capacity load safely under even adverse conditions.

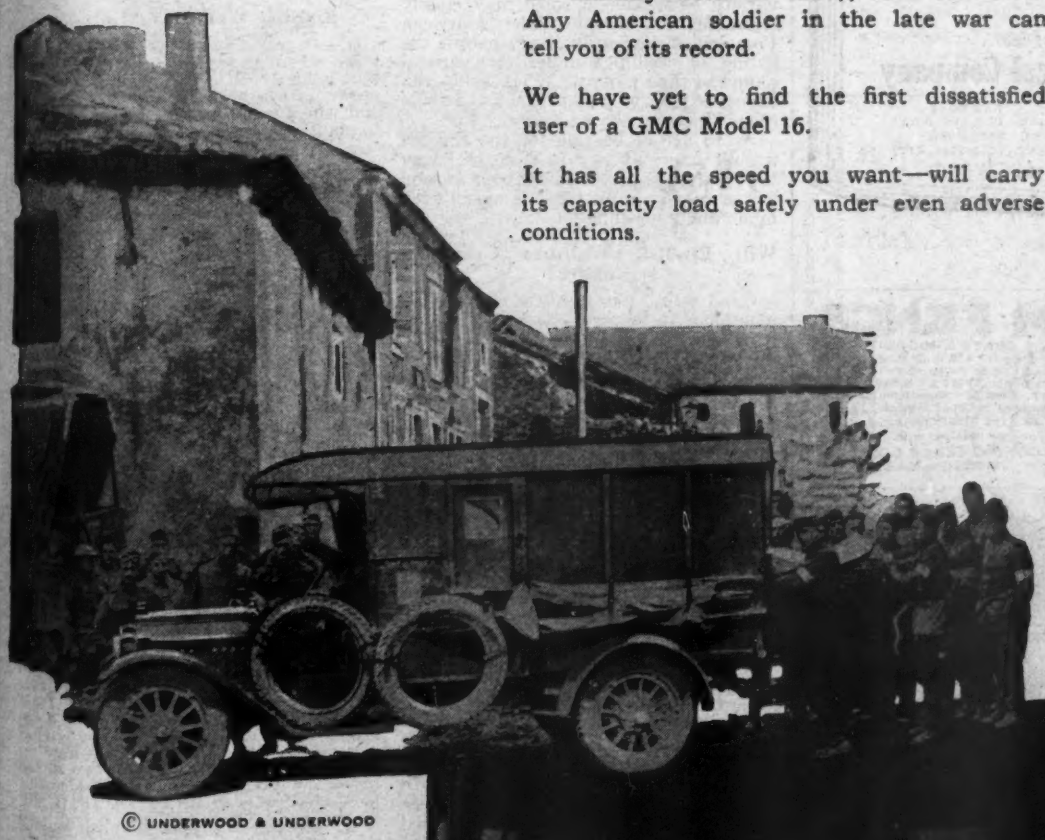
It's a time saver and money maker for any man who needs a truck of this capacity.

For the dairyman, the fruit grower, the market gardener, the small stock raiser and the general farmer who does not have need for a heavy truck it has no superior.

But the Model 16 is only one of a family of five GMC trucks, ranging in capacity up to 5 tons.

Thousands of GMC trucks are in service in all kinds of business. GMC dealers and service stations are to be found in every state in the union.

Tell us the nature of your roads, the distance you have to haul and your principa uses for a truck and we can help you select the proper model.



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They are specialized fertilizers that help to produce maximum yields. They are made to suit your crops and farm conditions; special fertilizers for top-dressing grass, special fertilizers for Corn, Oats and other grain, special fertilizers for use with manure or without.

Our Agricultural Service Bureau can help you to select the fertilizers best suited to your crops and your own farm conditions. This Bureau has made fertilizer tests in many states. It is under the personal charge of Dr. H. J. Wheeler, formerly Director of the Rhode Island Agricultural Experiment Station. Write for information. The service is free.

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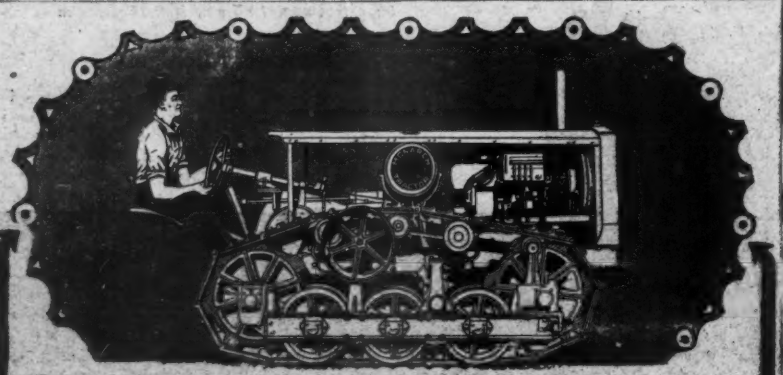

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The MONARCH 16-9 is the logical tractor for the Fruit Grower. It has a long track which allows it to develop its fullest traction, a rating of 16 H. P. on the belt pulley, 9 H. P. on the drawbar; powerful enough to pull two plows under any condition or three plows when the soil conditions are favorable; turns in its own length and will work in the orchard close to the trees; it is completely spring mounted, easy to operate and does not tire the operator; it has a belt pulley of the proper size located on the side of the machine. There are three speeds, 1½, 2¼ and 3½ M. P. H. with a governor which regulates the motor and speed at all times.

Write for literature on MONARCH Tractors. We will also be glad to send you our *"Performance Booklet."*

GENERAL TRACTORS, Inc.

209 Old Colony Building, CHICAGO

Questions About Nuts

There is a widespread and rapidly increasing amount of interest in nut growing, as knowledge is gained of the food value of nuts, and the profits of growing them. Nut trees of some kind are adapted to almost every soil, climate and location in the country, and many kinds are worthy of commercial cultivation. In this department will be found much helpful information about nut culture. Questions from subscribers are desired upon any topic relating to nut growing. Those questions of general interest will be answered through these columns, and others will be answered by letter. Address, W. C. Deming, AMERICAN FRUIT GROWER, Chicago, Ill.

Do Nuts Come True From Seed?

Q.—I want to plant some English walnuts and would like to have your advice. Will trees grown from nuts bear the same kind of fruit? Where can young trees be bought? About what age do they begin bearing?—F. T., Virginia.

A.—I wish that you could see some of the cuts that have been published showing the diverse forms of nuts that have been grown on trees that were all seedlings from the same tree. It is hard to believe them truthful. Hundreds of pecan trees have been grown from the seed of a single tree and not one of them bore nuts like those of any of the others nor of the parent tree. It has been said that the English walnut is an exception, especially when first generation nuts are used, but this is true only to a limited extent. All the trees will vary more or less in their characteristics. Every seedling is a new variety even though some may closely resemble the parent. The American Pomological Society will not permit the listing of seedlings under the varietal names of their parent. What would you expect to get if you planted a lot of apple seeds all grown on one tree?

As to age of bearing for the English walnut one may say in a general way that grafted trees will bear about as soon as the average apple tree. You can't tell much about seedling trees.

Will English Walnuts Grow in Dakota?

Q.—I would like to ask if the walnuts mentioned in the recent article by Daniel N. Pomeroy will grow as far North as South Dakota?—H. D. W., South Dakota.

A.—I am afraid that South Dakota is too cold for the English walnut. Better experiment with our native nuts especially the black walnut, butternut and filbert. They grow the black walnut in Minnesota and A. W. Latham, Secretary of the State Horticultural Society, 20 Kasota Bldg., Minneapolis, could tell you something about them.

For information about the Pomeroy walnut see my answers to other correspondents in the American Fruit Grower.

English Walnut in the South

Q.—Will you please give me your opinion in regard to growing English walnuts in central Mississippi?—J. B. R., Mississippi.

A.—I understand that quite a good many English walnuts are grown in Mississippi but I have never been able to locate the growers. In the southern states root knot seems to have interfered with growing the English walnut but as the black walnut appears to be free from this disease it is likely that the English walnut grafted on black walnut roots, as is now the practice of all the best nurserymen and growers, would have a better chance of succeeding in the southern states. It is worth trying and I enclose a list of nurserymen from whom such trees can be obtained.

About Pecans and Filberts

Q.—I notice in an article in the November American Fruit Grower you mention the Schley pecan as being a very valuable nut. I would be much pleased if you would write me whether or not it would flourish in this climate, southern Indiana, and where the trees could be obtained. Can you give me any information regarding a good variety of European filbert, and whether or not you would consider it a good commercial enterprise to plant a good acreage of them?—E. P. F., Indiana.

A.—The Schley pecan will not flourish in Indiana but that misfortune is the less because there are many fine pecans that are native to Indiana and are perfectly home there. Run down to Vincennes and see Mr. Reed at the Vincennes Nurseries and you can see the grafted trees, some even bearing in the nursery rows. If you will go a little farther you can see, all about the Evansville district, the native trees from which the nursery trees have been propagated and many other fine bearing trees. Some of these pecans, though not as large as the Schley, will rival it in every other respect. You will not be disappointed either in the quality of the nuts nor in their adaptability to your locality.

Do not plant a good acreage of the European filbert until you have familiarized yourself with all the problems connected with growing that nut and have made some experiements. I believe that there is a great future for filbert culture but there are yet some factors not completely worked out. Mr. Reed can show you many filbert trees as well as other kinds of nut trees.

English Walnut in Indiana

Q.—In reading your November number I see where there is an English walnut that is hardy. Do you think it could be grown in southern Indiana with success and where could we get the nuts or trees to plant?—Mrs. J. R., Indiana.

A.—We must remember that the English walnut is not a native of this country and therefore not so adapted to our conditions as are our native nuts. It needs good, rich soil, a little lime, the weeds must be kept away from it and a good mulch placed around it. Some winter protection for the trunk for a year or two will prevent sunscald.

I do not advise seedling trees except for experimental purposes. They vary in hardiness, productiveness and the character of the nuts just about as would apple or peach trees grown from the seeds of these fruits.

The tried and true nut for your locality is the Indiana pecan which you can get from some of the nurserymen on the enclosed list of names.

Winter Protection for Nut Trees

Q.—I have a place in Michigan, just across the lake from Chicago and am interested in nut growing. I set out twenty-four trees this spring and eleven of them died, and the rest do not look good. I would like to set about six English walnuts and six chestnuts. Please let me know what to do for them for the winter. Should I cover them around the bottom or not? How deep are nut trees to be planted? The English walnut trees I set in the spring were set with the grafted part about two inches below the ground level. Is a budded tree better than a grafted tree?—G. F. H., Ill.

A.—If you set your English walnut and chestnut trees this fall you should give them some winter protection in your climate and do so every winter until the trees are well established. Mound them up a foot high with earth and protect the trunks above with some kind of wrapping. Remove these in the spring.

Set the nut trees about one inch below where they stood in the nursery, which can generally be told by the looks of the trunk. I would not set the point of grafting so deep as you did.

I think that there is practically no difference in the value of budded and grafted trees.

NO DANGER IN SPRAYED FRUIT

R. H. Robinson, associate chemist of the Oregon Agricultural College, has completed laboratory tests of sprayed fruit, and his conclusions are that in order to get an average fatal dose one would have to eat 300 apples. It would be impossible to eat enough apples to cause poisoning. His experiments were made upon apples that had received five sprays of double the ordinary strength during the season.

Stop Feeding Away Your Profits

There's only one way—*spray and spray right.*

Spray at the right time and spray with the right kind. You probably know the enemy's habits and when the most timely spraying or dusting can be done. If you're in doubt ask for Glidden spraying literature.

And spray with the right kind. That's just as important as spraying at the right time. Users of Glidden sprays know this from experience. They know how the Glidden kinds spread the poison evenly over all of the foliage and keep it there until it does effective execution.

They know, too, that the big factor in this result lies in the Glidden organization and the complete equipment in the big Glidden plants. Having used Glidden products over and over again they have had evidence of uniformity as well as quality.

The Glidden line includes:

Glidden Dry Powdered Arsenate of Lead,
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Everywhere on Everything

Glidden Products cover such a wide range of usefulness that "Everywhere on Everything" is now a true expression of Glidden service. On farm buildings, on the farm implements, in the farm home, everywhere on everything. Glidden Paints, Varnishes, Stains and Enamels are providing the necessary protection and where needed, attractive decorations as well. There are Glidden Dealers in every locality.

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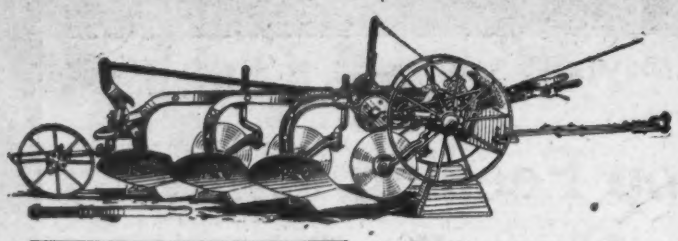

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Little Genius
Power-Lift
Tractor Plow

Built for
Work in

Orchards and
Vineyards

Two Sizes
Three and Four
Furrow

10-inch Bottoms

THIS plow has a *low frame,* with *down-lying levers,* and is built especially to crawl around under the trees and vines of orchards and vineyards without catching and damaging the overhanging foliage.

It is made with a *narrow wheel tread,* the front furrow wheel being set in line with the rear bottom, and the plow can be run in as close to the trees as the conditions warrant.

The bottoms cut 10-inch furrows, consequently the three-bottom orchard and vineyard plow has practically the same capacity as two 14-inch plows. The small tractor that pulls an ordinary two-furrow plow will pull the three-furrow orchard plow with the same ease.

The Little Genius is a power-lift plow, and *one man operates both tractor and plow,* the bottoms being raised and lowered by one trip rope, placed within easy reach of the operator, who controls the plow from his position on the tractor. Both wheels can be raised for opening the first furrow to a depth of 8 inches. Wide tires prevent wheels from sinking into loose soil.

Has all the features of strength, simplicity of construction and ease of operation that have made all P&O plows just "a little better" than others.

The **International Tractor** and the **Little Genius Plow** are made for each other by the Harvester Company and they comprise the ideal one-man outfit. Ask the International dealer.

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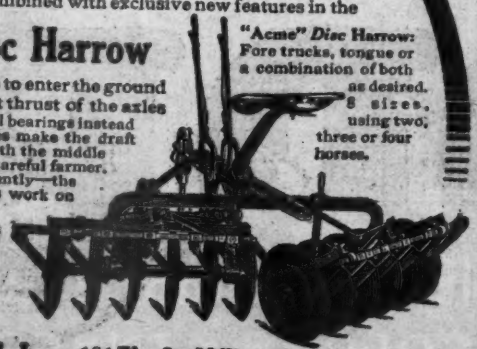
"Acme" Disc Harrow

The discs are so shaped as to enter the ground with a clean cut. The direct thrust of the axles is taken up on dust guarded ball bearings instead of cast bumpers. These features make the draft light. Offset gangs do away with the middle ridge so objectionable to the careful farmer. The gangs can be set independently—the driver can hold the tool to its work on steep hillsides. Pressure springs make the discs "bite in" and prevent skipping of low spots.

Order early so as to secure a full season's use. Write today for circular and prices.



"Acme" *Disc* Harrow: Fore trucks, tongue or a combination of both as desired. 8 sizes, using two, three or four horses.

Duane H. Nash Inc., 121 Elm St., Millington, N.J.

Bee Keeping for Profit

While bee keeping in a commercial way is as highly specialized as any other branch of farming, every fruit grower needs bees in or near his orchard. To the inexperienced bee keeper, questions are continually arising, and we will be glad if you will submit such questions to us. Our experts will be glad to help you. Address, F. C. Pellet, AMERICAN FRUIT GROWER, Chicago, Ill.

COMMON CAUSES OF FAILURE WITH BEES

By Frank C. Pellet, Illinois

OF THOSE who keep bees, not more than one in ten gets the kind of crops of honey that should be produced. To the average man, there is not much to beekeeping. He usually regards the hiving of swarms and the putting on and taking off of supers as about all there is to the business. With such an attitude, it is not surprising that returns are small. Profitable honey production is not a difficult process, and the fundamentals are easily understood, but there are a few things that must receive proper attention at the right time or failure is the result. The writer's experience of five years as State Apiarist of Iowa, brought him into contact with beekeepers of all classes. It also led him into hundreds of apiaries where the bees were examined and the common practice noted. There were a few causes of failure so generally present as to be worthy of comment.

The Small Hive

Because it was cheap, the eight-frame Langstroth or dovetailed hive has been sold by millions. The small hive is an expert's hive and requires far more attention than a large one. While it is possible to get good results with such a hive, if sufficient attention is given, it requires far less labor with a large hive. For the man who expects to keep bees with a minimum of attention, nothing but a large hive should be considered.

The small hive requires that two stories be used in early spring for brood rearing, if the colony is to become sufficiently strong to harvest a really profitable crop of honey. It takes big colonies of bees to gather big crops of honey, and it is impossible to get a maximum colony unless there be sufficient room for a prolific queen to lay the eggs of which she is capable. Again, the small hive is very likely to be left with insufficient stores in the fall and the bees may die before spring for lack of food. Expert beekeepers make sure that every colony has sufficient food for the winter months, and those which are short are fed with sugar syrup. There are untold thousands of empty hives scattered over the country because they were too small to hold a vigorous colony of bees during the harvest, and still leave room to store sufficient food for winter. For the reason that the strong colonies occupy more space with brood rearing, it usually happens that the strongest colonies starve first in neglected apiaries.

The writer never recommends anything smaller than the 10-frame Langstroth hive for any purpose, and the man who wishes to relieve himself of unnecessary labor should consider the advantages of the larger Dadant hives. However, the Dadant hives are best suited to extracted honey. To the man who wishes to produce honey in sections the 10-frame Langstroth or dovetailed hive is probably best.

Lack of Storage Room

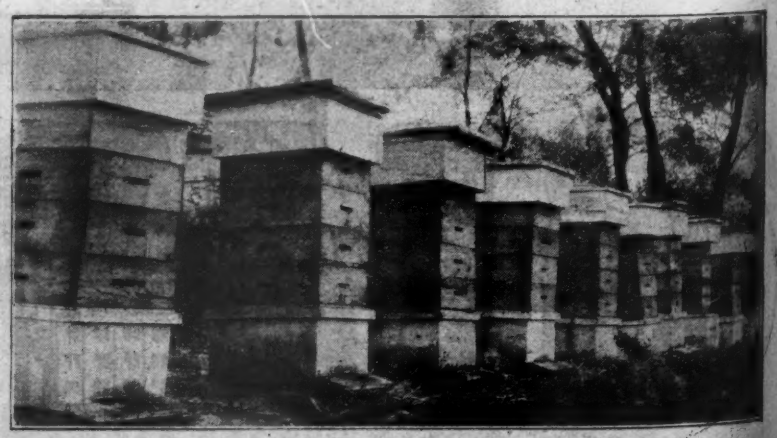
Another extremely common cause of failure is the neglect to give the bees sufficient super room for storing the honey when the crop is on. In many cases a single super is placed on the hive and left there until filled, even, in many cases, over winter when not used the same season. It should be understood that the real honeyflow is usually rather short. In some localities there are several flows coming at different times in the year.

In many of the northwestern states there is but one good flow, and that from white or alsike clover. In some parts of the clover region there is a second flow in fall from buckwheat or heartease or other fall plants. The light flows of nectar coming to the hive at other seasons, are all likely to be consumed in supporting the bees and in rearing brood. Unless there is an abundance of honey present in the hive in spring, the bees will be unable to build up rapidly and become sufficiently strong to store a crop when it comes.

When the flow begins the bees often store from five to fifteen pounds of honey a day for a short time. With but one super there is only room for a small part of the bees to work and the rest will loaf and hang on the front of the hive. In such cases they usually swarm at the height of the flow and divide the colony at the time when it should be kept together to secure a profitable crop of honey.

It often happens during a good flow of nectar that the bees will be working in two or three supers at the same time, and that two or more supers will be filled almost as quickly as one would be alone. The first super should be given the bees in advance of the beginning of the main flow. As soon as the bees are working freely in it, a second should be

(*Continued on page 66*)



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It required only thirty days for our new five-passenger "Glenbrook" to establish itself as one of the most popular cars on the American market.

Now, its reputation has become International and the demand from Great Britain alone is far in excess of our export allotment.

The "Glenbrook" is a tremendous success—there can be no doubt about that. It has won its way into the hearts and minds of the Motoring World almost over night.

It has made more real friends, in a shorter space of time, than any other model ever produced by this Company. If you are at all familiar with Paige history, you will appreciate the significance of this statement.

There is, of course, a very definite reason for such universal endorsement of our new car. You will find it in the single word, *Performance*, as expressed through a strictly modern power plant and chassis.

The "Glenbrook" is not a racing car though it is easily capable of sixty miles per hour. What is vastly more important, it is an utterly dependable car—one of the most thoroughly *satisfactory* motor vehicles that has ever been developed for the road.

By "Satisfactory," we mean that it possesses all the power and speed that a sane man could possibly desire. We mean that it offers the true luxuries of exquisite design, ample room, soft upholstering and velvety spring suspension—all these without the burden of excessive upkeep.

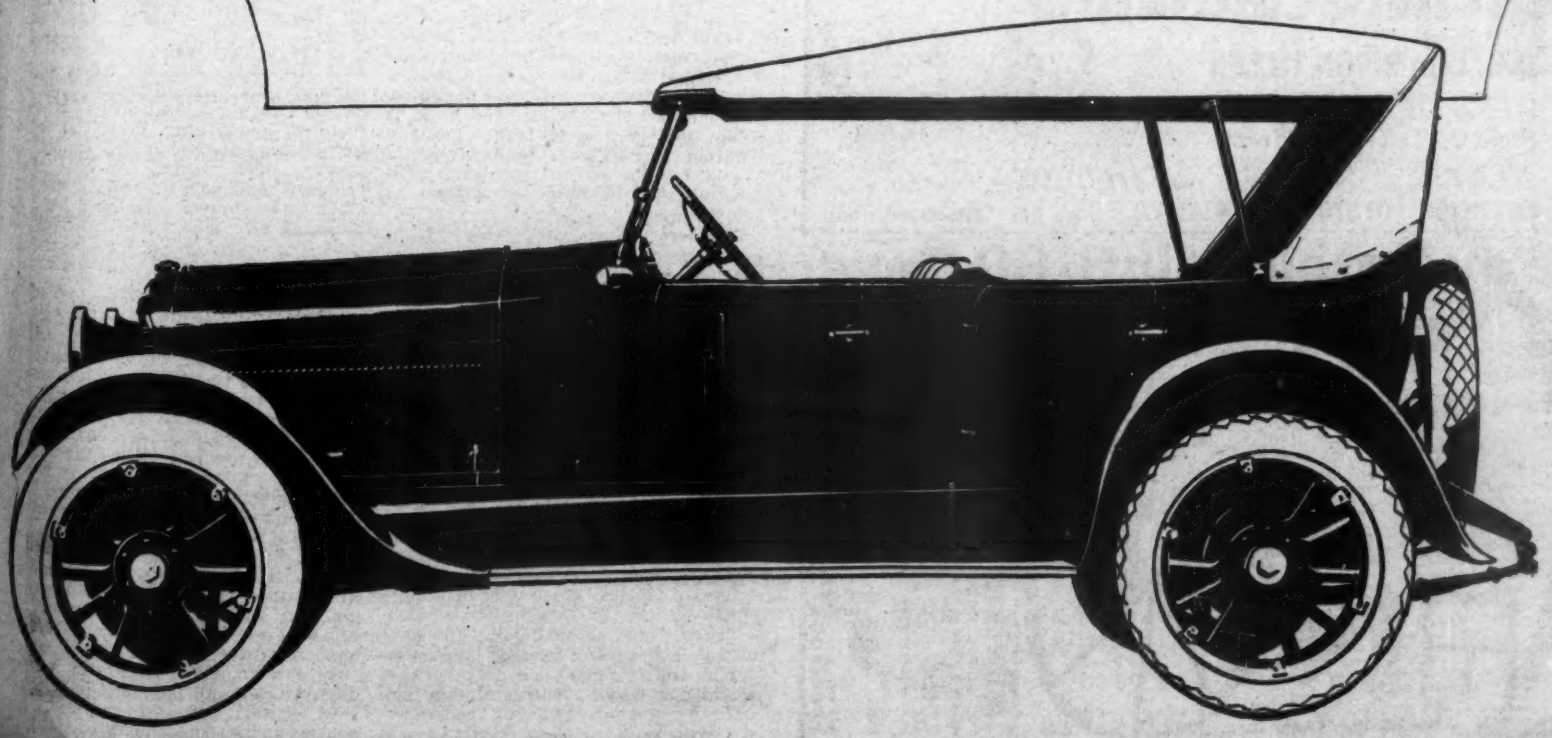
It is, in a phrase, the Ideal five-passenger motor car—an incomparable investment in six-cylinder transportation. The logical recognition of this fact has resulted in a permanent demand that is World Wide.

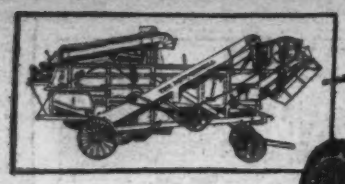
We predict that you are going to hear the "Glenbrook" referred to as the greatest dollar-for-dollar value on the American market. It possesses such obvious advantages over the usual type of five-passenger car that this conclusion would seem to be inevitable.

However, you alone must be the judge of comparative values. We merely ask you to take one ride in the "Glenbrook" and form your own opinion. On this basis we are content to rest our case because we know that our three years of experimental work and testing have, indeed, produced the finest of all light sixes.

PAIGE-DETROIT MOTOR CAR COMPANY, DETROIT, Michigan

Manufacturers of Paige Motor Cars and Motor Trucks





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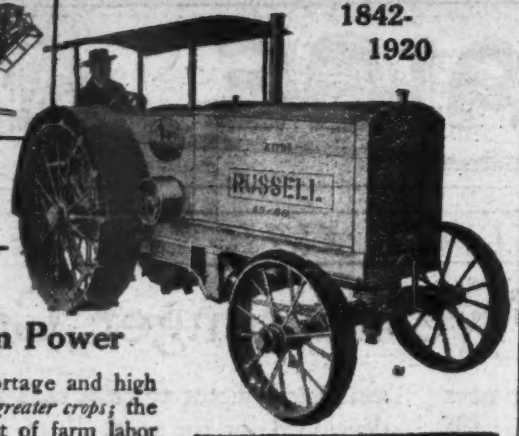

This Year—

Demand

Reliable Farm Power

The world-wide shortage and high price of food demands *greater crops*; the shortage and higher cost of farm labor demands more and *more farm power*—tractors and threshers in particular.

The shrewd farmer cannot afford to risk trouble, loss, delays and breakdowns with new or untried machines—or those rushed through the factory to meet a sped-up scale of production.

For 1920 Russell will build only a few more tractors and threshers than last year—but will *build them right*—true to "old reliable" standards of quality and service.

These are the only kind of machines you want to buy, sell or use—but get your order in early to guarantee prompt shipment.

Send now for Big New Russell Catalog.

THE RUSSELL & CO. Massillon, O.

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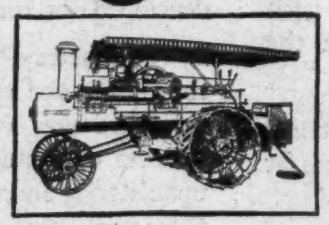
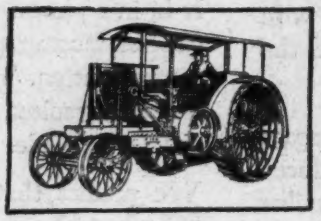
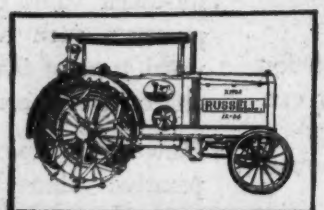






RUSSELL
THE OLD RELIABLE LINE

Tractors and Trucks for Orchard Work

By E. B. Stuart, Michigan

IT IS a poor business man these days who does not see the necessity, if not actual economy, in keeping up with the times, and if that axiom applies to what is commonly understood as "business," it certainly is applicable to fruit growing.

Of course a person must be his own judge whether he will conduct his business on a money-making, or personal-enjoyment basis. If the latter, his methods can be carried on to suit his fancy. But the purely commercial fruit grower, on the other hand, must keep abreast of the times and the necessities of the day, if he is to compete and get his share of business.

demands require quality, efficiency and service. Horses, and the absence of machinery to produce the right quality, are too slow and ruinous.

Power Machinery Pays

High power sprayers, tractors, and trucks solve these questions and are the only things that will. While we have our preference for certain types and styles of such machines, we believe that there are many other makes from which to select that will prove efficient. One important point to consider in the purchase of machinery, is the availability and promptness of shipment of new parts for repairs.

"In Our Orchards, the Tractors Do the Cultural Work but Leave the Hauling for the Trucks."

Many modern methods under present conditions are not, however, necessarily economical. People are exacting, notwithstanding the widespread feeling that the cost of living is high. Fruit growers must put forth more intense efforts to enable the production of the quality of fruit people want.

The commercial fruit grower is becoming more and more depended upon; ordinary farmers cannot give the time any more to produce quality fruit. And in order for the commercial grower to produce quality, he must apply every ounce of energy and thought to his product.

Requires Many Hands

Fruit growing requires more persons to the acre of production than does ordinary farming, and if the necessary labor were actually obtainable regardless of the wages demanded these days, it would put the price of fruit, especially tree fruit, so high that the grower would at once and in even stronger terms than now applied to him, be accused of profiteering.

Not only does the production of fruit; good fruit, require more hands per acre than general farming, but it now requires especial fitness and preference for it. The average farmer has not the patience, and does not see the real necessity for all the multitude of operations and details of the business that must be followed up with extreme precision.

With all these conditions staring the fruit specialist in the face, his only recourse is to invest in machinery to perform the work of human labor. This requires money and therefore, an investment on which he should receive compensation. This machinery consists of the same that would be required where plenty of help is available, together with tractors, trucks, etc., not heretofore employed.

Stuart Acres, consisting of 2,100 acres of fruit and general farming lands, uses trucks and tractors. To do otherwise, would now entail even more costs than were horses and man labor used exclusively instead. Modern methods and

It would, of course, be idle to say that all tractors and other machinery on the market are safe to buy. There are good, bad and indifferent kinds, the same as with everything else. Judgment must be used, but I am not, in the scope of this article, supposed to exploit any one or a group of makes of machines.

In young orchards, the small tractor is, in our experience, an absolute necessity where the owner of the orchards must depend on hired help for the plowing and other cultural work. Even with tractors, it is hard to get men who will do the work with care and not injure the trees. However, of the two evils, tractors are preferred to horses for orchard culture.

If the orchard is not too large and so that the owner can do much of the cultural work, a small tractor that will handle two plows, will do all the work required—plow, drag, draw the seeder for putting in cover crops, handle the mower, rake, loader, or any other ordinary appliance in orchard use, including the sprayer. He need have no horses at all. The truck will haul the fruit to market, or the tractor, though perhaps too slow, will haul the wagon loaded with fruit.

Hauling Done by Trucks

In our orchards the tractors perform all kinds of cultural work, but leave the hauling work to trucks. This is advisable because a wagon is usually unsatisfactory. Good springs are necessary. Fruit will not stand the rough riding it is subjected to when wagons are used to haul it to market. In buying trucks good judgment should be used and attention paid to the springs with which they are equipped. And even with trucks, too much speed must be avoided, and consideration exercised in loading. After utmost care has been used in picking and loading the fruit it can be ruined even in trucks by a reckless or speedy driver.

In a word, the purchase of a truck deserves care and judgment in selection with especial attention to spring suspension and its adaptibility to the load.

Orchard Cultivation

Is simple and easy with an

O.K. CHAMPION TILLER

It reaches in under the low branches and stirs all of the soil **Right Up To The Tree Trunks** without damaging the boughs or fruit.

Further Information Cheerfully Given.

CHAMPION POTATO MACHINERY CO., Dept. 11, Hammond, Ind.

Pay Nothing Until 60 Days

Majestic Garden Plow and Cultivator

Wheel 24 in. x 1¾ in. rim. Mold board. Reversible shovel, Weeder and cultivating tool and wrench. Oak handles can be raised or lowered. Slotted foot changes draft to suit different soils. Wearing parts are carbon plow steel. Will last for years. See for yourself on the 30 days free trial. Shipped from factory in Northern Ohio. Shipping weight about 24 lbs. Just send the coupon—no money.

Not a cent to pay now. Just tell us to send this Majestic Garden Plow and Cultivator. Use it 30 days and then if not satisfied, return it and we pay freight both ways. If you keep it, send first payment 60 days after arrival—balance in five equal 60 day payments. Absolutely reliable but very simple and easy to operate. Great for farmer's wives and the boys and girls as well as grown ups. For hilling and weeding peas, beans, tomatoes, cabbage, corn or other crops planted in rows. Strong, but light. Well finished. (See description of parts at left of cut.) No better garden plow ever made. And only the coupon brings it.

Order No. AS3A3A106. Price $14.50 cash with order, or only $1.00 in 60 days. Balance $1.00 every 60 days.

SEND ONLY THIS COUPON

The Hartman Co. Dept. 2470 4918 LaSalle St., Chicago

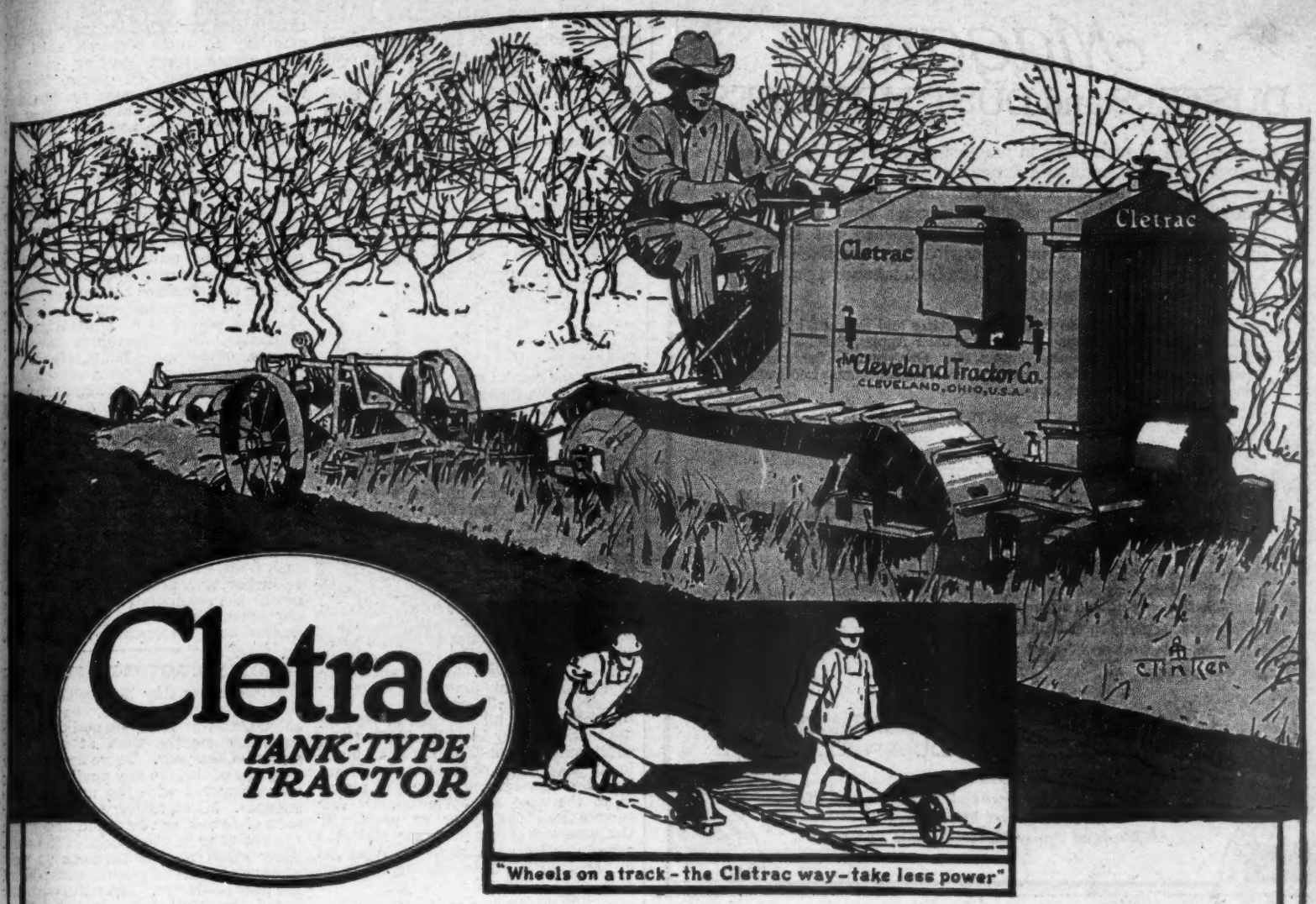
Send the Majestic Garden Plow AS3A3A106. If not satisfied I will return it and you are to refund the purchase price. If I keep it I will pay $1.00 in 60 days, $1.00 every 60 days after arrival until $14.50 is paid. Title to remain in you until fully paid.

Name.....

Address.....

Free Book Send for the Bargain Catalog of Lifetime Implements and Tools

Take a Year to Pay



In the Orchard—with a Cletrac

Plow your orchard better this year—put a Cletrac on the job.

Small, powerful, easy to run—working every day, 24 hours a day if necessary—the Cletrac plows closer to trees, quicker and at a lower cost.

Laying its own endless tracks, the Cletrac travels the orchard floor with a light, sure foot and a strong, steady pull.

Low-hung, with no projections—it weaves in and out and around trees without injuring bark or branches. Turns short—gets the corners, works in the sticky places—goes everywhere, with power to spare.

The Cletrac rides on top of the soil—doesn't pack it. That's why it's so good for discing and other mellowing jobs.

Spraying, ditching, fertilizing, road building, operating cooper shops and cider mills—these are but a few regular Cletrac jobs. All the year around—any time, anywhere—it does all your haulage and belt work. Operates perfectly on distillate or kerosene.

The Cletrac costs less to operate than any similar power unit or the six or eight horses it replaces—works more hours a day and more days a year, too.

Be ready when the rush comes—get your Cletrac now.

Write today for that interesting booklet, "Selecting Your Tractor"—it's free

The Cleveland Tractor Co.

LARGEST PRODUCERS OF TANK-TYPE TRACTORS IN THE WORLD

18935 Euclid Avenue Cleveland, Ohio

Niagara
DUSTERS and DUST MIXTURES

have proved of such value in practical commercial use for the control of insect pests and fungus diseases that every year many more successful fruit growers are finding the Dusting method indispensable in making summer application, not alone on account of the results accomplished but because dusting is so much faster and cleaner it has proven itself about 1-3 less expensive than spraying when both labor and materials are taken into consideration.

Send today for our free book on dusting and find out just what Dust Machines and Materials to use to protect Apples, Peaches, Pears, Cherries, Strawberries, Grapes, Potatoes, etc. Our years of experience are at your service. Our free book gives you the careful, accurate information gained in successful commercial protection.

For best results always use Niagara Dust Materials with the Niagara Duster.

For Dormant Spraying

Niagara Soluble Sulphur Compound

(The original Soluble Sulphur in powder form)

dissolves instantly in hot or cold water. Assures clean Top-of-the-Market-Fruit. Absolutely the best spray material for the control of San Jose Scale, Peach Leaf Curl and other similar orchard troubles.

This year it actually costs less than any other sulphur spray material.

Don't Pay Freight on Water! Send for Free Spray Calendar and get our prices.

Niagara SPRAYER COMPANY

147 MAIN STREET, MIDDLEPORT, N. Y.

Manufacturers of

Dusting Machinery for Orchard, Vineyard and Field.

Special Dust Mixtures.

All kinds of Spray Materials and Sulphur

Shall We Dust or Spray?

(Continued from page 14)

sprayed plots yielded 90 per cent absolutely clean fruit as against 82 per cent clean by the dusting method. In 1919 another orchard of Belle of Georgia peaches was dusted with the following results:

Dusting—Cost per tree 2⅓ cents.
Spraying—Cost per tree, 2 1-10 cents.

Dust	Dust %	Spray %	Check %
Curculio punctures, but not wormy	15½	1⅓	5
Scab	26	16	60
Brown Rot	½ of 1	0	19
Packing Grade			
Grade No. 1	91%	98½	38
" " 2	7½%	½	47
" " 3	½ of 1%	0	0
Cracks	½ of 1%	0	0
Dust injury	½ of 1%	0	0
Culls	0	0	15

Here the results seem more favorable than in apple dusting. Brown rot, the factor absent in most other experiments, was controlled. Scab was not taken care of by dusting as well as by spraying. Curculio was not controlled by dusting. Apparently dust gets the curculio but only after he has nipped the fruit. This does not materially affect the market grades but may be serious as points of inception for brown rot in transit, if temperature conditions are favorable. Dusting is far superior to no treatment but owing to the increased cost on level ground over spraying, it does not compare favorably with the latter. Possibly as an adjunct it has its place but owing to the poor control of scab and the cumulative effect of successive slight defoliations due to dust injury (possibly arsenical, owing to the fact that practically all arsenate of lead on the market today is diplumbic in form, which may be expected to produce burning in the absence of lime), it should not be relied upon wholly. In the mountains the ease of operation, its fair success and the lower or practically the same cost of operation may make the use of dusting advantageous. Again, as in the case of apple dusting, it is an individual problem.

Small Fruit and Truck Dusting

About the efficiency of strawberry dusting to control the weevil or clipper, there is no question. Tests conducted for two years in Maryland have failed to develop a more satisfactory dust than the usual 85-15 mixture of sulfur and arsenate of lead. Demonstrations with this material in four counties show a net profit to the growers over untreated checks of over $70,000. Over 2,000 quarts of berries above the yield on untreated checks was obtained in one instance. In most cases two applications were all that were required though where inopportune rains intervened other applications have been found profitable.

Power dusters on the large acreage with several spouts proved most efficient but all manner of dusters from the converted horse nozzle to the largest type of hand power dusters mounted on a wagon were used successfully.

Dusting to control the strawberry leaf beetle or adult of the root worm was eminently successful this year after a season's trial to effect control by spraying. Applications of 85-15 (sulfur and arsenate of lime), 65-20-15 (hydrated lime, dry Fungi-Bordo and arsenate of lead), and 85-15 (sulfur and magnesium arsenate) were equally successful in controlling the beetle with a slight advantage noticeable on the growth of plants where the Bordeaux mixture was used owing to partial control of the leaf spot. Mowing just before applying the dust showed to advantage in these tests.

Truck crop dusting has been practised for many years on a variety of vegetables, notably on potatoes with such universally good results in the control of chewing insects that there seems little room for doubt but that it has reached an established position. Control of diseases by this same method has not been demonstrated to such a marked degree but it may be considered as a definite possibility in many instances.

One factor that has not been determined satsfactorily and that can only be determined by years of experience is the possible cumulative effect of imperfect control of insects and diseases year after year in dusted orchards. It is well within the range of possibility that insects and diseases may increase gradually in such orchards until the time comes when dusting may be wholly ineffective. Of course, there is the possibility that new poisons and fungicides or a combination may be evolved that will be just as satisfactory as sprays. At present the dusts on the market do not seem to be as effective, generally speaking, as their equivalent in spray solutions.

Dusting machinery is far from the stage of excellence achieved in spray machinery construction. Lack of fan power, faulty control of the amount delivered, ineffective apparatus for preventing the formation of lumps or "balls" and weak mechanical construction are the chief points to be altered into the apparatus. Some machines have one or more of the above faults, others may have an entirely different combination of drawbacks, but all can stand improvement.

The market demands must be considered in any discussion of the future of dusting. Any kind of apple commands a high price today but will it tomorrow? Won't the pendulum swing back to the point where only the very best, blemish free fruit will pay?

All these things must be considered in addition to the foregoing data and each individual must make his decision to dust or spray according to his location, labor, the comparative freedom from diseases and insects, the grade of fruit he desires and his market requirements.

ERADICATE MITES BY SPRAYING

Mites, those tiny little pinkish pests that chickens are heir to, can be eradicated better at this time and during the next few months than at any other season of the year. There are generally very few of them in any poultry building now compared with the number in the summer. Mites, as every poultry keeper soon discovers, can be found underneath the roosts or in the cracks in the walls. They crawl on the chickens at night and suck blood and poultey thus afflicted are poor producers. The mites especially breed fast and thrive in hot summer weather. If the poultry raiser is thorough in his methods of extermination during the winter months, his birds will not be bothered with these pests in the summer.

The best and easiest way to fight mites and keep the poultry building disinfected is by use of a sprayer. Early in the morning, as soon as the birds are off the roost, start in. Fill the sprayer with any good poultry disinfectant, any of the regularly advertised brands now on the market, and spray not only the roosts, but the walls adjacent. Of course, if you haven't a sprayer, you can use a brush, but by use of a sprayer you can reach every crack, corner and crevice, where the mites are apt to hide. The plan of whitewashing the roosts and walls is also effective. There is a preparation now on the market called Carbola, that is both a whitewash and a disinfectant. Furthermore, the interior of any house that has been whitewashed is more attractive. Repeat this spraying and disinfectant operation once a week, and your birds will profit by it. There are many good sprayers now on market and every up-to-date poultry raiser should own one.

THE GIANT BEAN FAKE

Not since Jonah's gourd ran its famous Marathon, has that vegetable been brought so prominently before the public, but not under its lawful name, for we have the assurance of the Botany Department of the Michigan Agricultural College that the so-called "Giant Bean" which has been extensively cultivated for two years past, chiefly by city gardeners, is a true gourd of the "snake" shape. How depressing to raise a buster bean over a yard long and weighing twenty pounds (as has actually been done) only to find it isn't a bean after all. The rose somehow fails to smell as sweet by another name. Unscrupulous seedsmen, in order to dispose of a large surplus of gourd seed, were responsible for the widespread advertising that induced gardeners to plant "Giant Butter Beans," "New Guinea Butter Beans," etc.

EVERYTHING for the GARDEN

is the title of our 1920 catalogue — the most beautiful and complete horticultural publication of the year—really a book of 184 pages, 8 colored plates and over 1000 photo-engravings, showing actual results without exaggeration. It is a mine of information of everything in Gardening, either for pleasure or profit, and embodies the result of over seventy-three years of practical experience. To give this catalogue the largest possible distribution we make the following unusual offer:

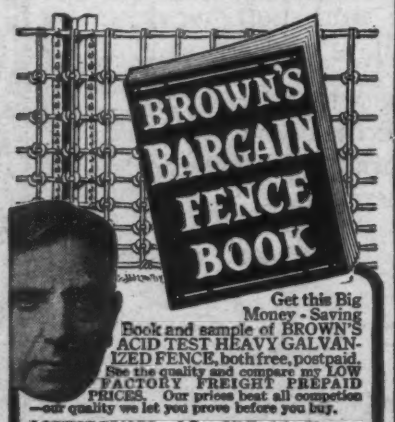
Every Empty Envelope Counts As Cash

To every one who will state where this advertisement was seen and who encloses 10 cents we will mail the catalogue

And Also Send Free Of Charge
Our Famous "HENDERSON" COLLECTION OF SEEDS

containing one packet each of Ponderosa Tomato, Big Boston Lettuce, White Tipped Scarlet Radish, Henderson's Invincible Asters, Henderson's Brilliant Mixture Poppies and Giant Waved Spencer Sweet Peas, in a coupon envelope, which when emptied and returned will be accepted as a 25-cent cash payment on any order amounting to $1.00 and upward.

PETER HENDERSON & Co. 35 & 37 CORTLANDT ST. NEW YORK CITY



Get this Big Money - Saving Book and sample of BROWN'S ACID TEST HEAVY GALVANIZED FENCE, both free, postpaid. See the quality and compare my LOW FACTORY FREIGHT PREPAID PRICES. Our prices beat all competition—our quality we let you prove before you buy.

LOWEST PRICES—I Pay All Freight Charges

Don't buy a rod of fence this year until you get my New Bargain Fence Book. Shows 150 styles. Also Gates, Lawn Fence, Barb Wire—all at startling low prices. A postal brings sample to test and book free, postpaid.

THE BROWN FENCE & WIRE CO. (H) Department 425 CLEVELAND, OHIO

From FACTORY to YOU

Avoid delays and avoid paying an extra profit, by getting

Vapor Tight Piston Rings

straight from our factory. We manufacture all sizes—*and sell direct to users, at factory prices.* Two VT Rings to a piston prevent any leaking in cylinders—and produce the maximum compression.

Order *NOW*—giving cylinder diameter and exact width and depth of grooves in pistons; or write for our new descriptive Circular—we send it FREE.

Vapor Tight Ring Co.

Box 1772-X Minneapolis, Minn.

A Packard Truck hauling heavy load from the field on a Washington farm

Moving the City Market Next Door to the Farm

THE most striking thing about the modern farmer is the way in which he reaches out for new markets.

One Packard Truck owner covers *140 miles a day* between his farm and Detroit, Michigan, in the short running time of *10 hours*. By choosing the biggest market in the State, he commands the top price for his produce, *markets perishable fruit* that would otherwise spoil, and saves all the *shrinkage* that occurs in shipping by railroad.

Once a farmer gets to know the constant dependability of the Packard Truck, he begins to demand more of it and to *increase* his *profits* from its operations.

ON hundreds of farms, all over the country, the Packard is being used, not necessarily to reach the near-market, but to reach the most *favorable market*, whether that is forty, sixty, or even eighty miles away.

Only a truck with the *uniform quality* of the Packard can be depended upon for these long hauls. The Packard is not an "assembled" truck—a mere collection of purchased parts. Every part of *every Packard Truck* is of Packard design, of *uniform strength* and *durability*. That is the reason you find so many Packard Trucks on the road, month after month, without an hour's delay for repairs.

There is a Packard for every size farm. Write for our booklet, "The Farmer—and the facts about his motor truck." It will interest every forward-looking farmer.

"Ask the Man Who Owns One"

PACKARD MOTOR CAR COMPANY, *Detroit*

OSPRAYMO SPRAYERS

For Better Fruit

Our Trade Mark

The Leader FIELD FORCE PUMP CO. OSPRAYMO LINE OF SPRAYERS ELMIRA, N.Y.

Insist on it

Continuous HIGH PRESSURE Spells Success—The OSPRAYMO Sprayers guarantee thorough agitation of mixtures, and have Automatic BRUSHES for keeping suction pipes clean. No expensive delays with the OSPRAYMO.

There is a model for every need.

A booklet containing formulas and directions FREE.

If your dealer does not sell the famous OSPRAYMO Line write for prices and discounts today.

The SENIOR LEADER has steel frame, 4 H. P. Leader Engine, Triplex Pump driven by Diamond chain belting. Mechanical Agitator and Automatic Brushes, and improved Pressure Regulator.

FIELD FORCE PUMP CO.
Dept. B Elmira, N. Y.

A SPRAYER for Every Need
HIGH PRESSURE Guaranteed

Strawberry Raspberry, grape, currant, blackberry plants, trees and flowers. Everything to plant. Will pay you to answer this little ad. Valuable list FREE. Write THE ALLEGAN NURSERY, Box 33 Allegan, Michigan

Guaranteed 6 years. American movement, stem wind and set watch, fancy design back, wonderful timekeeper, for selling 20 large, colored pictures or 20 packages post cards at 15c ea. Order your choice. **FREE**

SENT PREPAID. GATES MFG. CO. DEPT. 537 CHICAGO

BALDWIN'S

Big Berry Plant Book Is Now Ready For You—

One of 100,000—and it's chockful of information about berry plants—when to plant them, how to grow them, how to care for them, how to make a success of the berry business—all plainly told by one who knows, backed by more than thirty years' experience. This instructive Fruit Growers' Guide tells you how to get big crops from standard varieties and everbearing Strawberries and other small Fruits. All Baldwin plants are produced from new rich soil, free from insects or diseases, well rooted, hardy and vigorous, making sure that you can start right. It shows the most complete line of small fruit plants to be found anywhere. You make money when you do as Baldwin te... ...tart right. Get the best.

Plant Baldwin's Berry Plants

and Help Produce Healthgiving Food.

All true to name. They are large, heavily rooted, sure growers, because grown on new fertile ground. The kind that produces profits—big profits—quickly. We grow them by the million. The same attention, the same cultivation, that you would give to a garden of but a few plants. We want you to get our Big Berry Book now and place your order early while we are well stocked and before our varieties are depleted. Have had a most excellent growing season. Well supplied with plants of all standard varieties—Now. The demand is going to be heavy. If you act quickly you will run no danger and there will be no delay on our part. We can save you money. We want you as one of our satisfied customers. You need the profit—the world needs the fruit. Do your duty in producing wholesome healthgiving food. Send for Baldwin's Big Berry Book. Save a day—write tonight.

O. A. D. BALDWIN
R. R. 11
Bridgman, Mich.

The Culture of Blueberries

By Myron T. Bly, New York

THE past few weeks have been a period of wonderment. I have wondered and kept on wondering how prehistoric man tamed the wild plants to yield his living. Whether the Aztecs ran up against inexplicable failures when they began the domestication of the wild grass which was the progenitor of corn. It is all because of the behavior of some of my blueberry plants.

Before I began experimenting with blueberries, I well knew that I was dealing with an untamed plant which would not thrive in a tamed soil—that successful blueberry culture demands a highly acid soil such as prevails in the wild haunts of the plant. I thought I was setting the bushes just where they wanted to be. It was a clearing at the edge of the woods. The timber had recently been cut and there were oak and chestnut stumps and the growth and flowers of the woods. It was the side of a sandy ridge, locally known as a "hog back." It is bordered on three sides by a forest of oak and chestnut. It is in a geologic erosion area about a mile back from the beach of Lake Ontario.

After the present growing season was well advanced, I noticed that here and there was a plant that stood still. Most of them started out vigorously, and by the first of July many made a two foot growth. I am referring to a planting last fall.

Last year I observed the same conditions in a planting of the previous year and attributed it to the fact that the non-thriving plants had not yet become established. I feel confident that I have arrived at the solution. It has been by a process of elimination. I have eliminated possible causes of non-growth and only one rational explanation remains. We got careless at planting time. We intended to rake the peaty surface soil into the holes and cover the roots with it. But no doubt we had in mind that the soil ought to be sufficiently acid down to the bottom of the holes.

There is where we missed out. The leaf peat was only two or three inches in depth from the surface. Our holes were dug to a depth of twelve to eighteen inches to accommodate the big root systems and the roots of the plants which do not grow got below the effect of the surface acidity. We failed to put sufficient peat into the bottom of the holes and to use peat to cover the roots. All of the plants which were properly set in peat last fall bloomed this spring and some of them are carrying clusters of berries. Another matter which has retarded the growth of some plants is the fact that we did not apply the thick leaf mulch all over the patch until late this spring. Those which were thickly mulched with leaves last fall at planting time have made the best progress.

Planting Instructions

I used to say that for garden culture the trench or holes in which plants are to be set should be two feet deep and eighteen inches wide and be filled in with peat to the proper height before setting the plants. I am now inclined to say that if one wants to make a good job of it, the holes better be two feet all around and nothing but leaf peat be placed above or below the roots. By leaf peat I mean surface scrapings from sandy, upland woods. I distinguish it from leaf mold. The latter may be rotted leaves and have lost its acidity. In a location such as mine, a thick leaf mulch, so thick that weeds cannot get up through it, seems to be a necessity. The mulch should be preserved by making yearly additions. The soil will thus be kept acid.

I should add that my successful plantings are of the common swamp blueberry (Vaccinium corymbosum). One would be inclined to suppose that this variety should be planted in a wet place. That does not conform to my experience. If I were selecting plants from a "huckleberry bog," I would take them from a dry hillock. After all, it will be found that the transplanting of wild fruiting plants will be a slow process of getting the delicious fruit. Such plants must be cut back severely. The root stocks are likely to be undeveloped and the shock so taxes the vitality of the plants that considerable time must elapse before they fruit. Even with the best of care a certain proportion will never thrive. It is better to purchase the bushes from those who have grown them in the nursery.

Questions About Varieties

I am frequently asked about varieties. In some sections all blueberries are divided into two classes, the "swamp" and the "upland." But there are varieties of the upland. One is the dwarf (vacillans). Another is frequently known as the low bush blueberry. It is not advisable to try either of the upland varieties except for ornamental or experimental purposes.

In my high, sandy location the kind which is found growing wild in swampy or boggy places (corymbosum) gives far the best results. I conserve and increase the natural moisture of the site by mulching. Given the above treatment, in any well aerated, sandy soil, the swamp blueberry grows vigorously. It needs plenty of room. We have set some of ours too closely and will soon have to move every other one. Three feet by five feet is close enough.

We expected that the plants would behave like the upland varieties because our location is such as where the upland kinds grow wild and they do not become a large bush. In the light of the present knowledge I do not advise the use of any fertilizer. I have heretofore suggested a little coarse stable manure on top of the leaf mulch. I hasten to withdraw that suggestion. Many wild plants have their special brand of inoculating root fungus and the blueberry is quite likely to have it.

If that is so, some forms of fertilizer would interfere with the functioning of the fungus. It would be best to leave them all out until experiment has discovered what can be safely used. I have tried hard wood ashes sparingly on some plants. In their wild haunts they get no artificial stimulant except the products of combustion as an occasional fire passes through. The plants treated with ashes do not respond. Experimenting is interesting but I am after the luscious blueberry fruit and first of all I want to find out whether commercial blueberry culture is possible and profitable. I believe that it is and that some one will have demonstrated it sooner than we expect.

TASMANIA SEEKS FRUIT FACTS IN UNITED STATES

By Robert E. Jones, California

With a climate somewhat similar to that of the deciduous fruit districts of the United States, Tasmania, an island of the antipodes and one of the Australian states, is pressing forward rapidly in the fruit industry and is seeking to learn and adopt modern methods as practiced in this country. Recently J. M. Ward, chief of the Fruit and Forestry Bureau of Tasmania, and F. J. Killaway, managing editor of the Tasmanian Orchardists and Producers' Association, visited California on a tour of inspection of California orchards. They spent much time with members of the staff of state director of agriculture George H. Heckle, who is a fruit man himself, and with other prominent fruit growers.

The Tasmanian men were greatly interested in fruit standardization as it has been legalized in California and, since their return, a move has been made toward instituting similar regulations in the British colony. County Horticultural Commissioner Fred C. Brosius of Sacramento, near which city the principal early strawberry district of California is located, has furnished the Tasmanian people with a complete outline of his methods of standardizing berries. A crop valued at more than $250,000 was shipped this season with a minimum of rejected crates.

Tasmania is growing peaches, apples and most other deciduous tree fruits and berries, both vine and cane varieties, quite extensively. Its markets are rapidly extending, especially to Europe.

A Giant Everbearing Quality Fruit which the U. S. Dept. of Agriculture states, "should be tried in gardens in all parts of the country."

La France
King of Raspberries
(Everbearing)

Raspberries from June to November! From your own garden to your own table! La France Everbearing Raspberry is Scheepers' latest introduction to the world of horticulture. Immense clusters! Giant berries—twice the size of the ordinary varieties! Firm, luscious fruit; deep-colored, wonderfully rich-flavored! And few seeds!

Tested and Proved for Three Years
Continuous Crop—Easily Propagated

La France Everbearing is a remarkable plant. Its hardiness and habits—its prolific bearing qualities, and its ease of propagation—make it a horticultural phenomenon.

Planted early in the spring, it loses no time getting started. Begins bearing as early as the first week of July (the first season!) and "never lets up"—keeps right on with break after break, cluster-laden shoots, until all vegetation is completely frost-checked for the season. Even then its remarkable nature continues in evidence: La France has demonstrated its hardiness by surviving temperatures as low as 30° below zero.

La France Everbearing Raspberry ***propagates freely and very rapidly.*** A dozen plants will produce a good-sized berry patch in an incredibly short time.

Its rapid growth, its hardihood to withstand extreme cold, its immunity from fungus and insect diseases, its remarkable all-season production of fruit, make La France Everbearing by all odds ***the*** raspberry for home gardener, fruit grower or farmer.

What a few La France growers say:—

T. A. Havemeyer, Pres. Hort'l Soc. of N. Y.—"Far superior to any other raspberry. Very prolific. Large clusters. Luscious berries. A remarkable plant. Should be grown by every garden owner, fruit grower, farmer, nurseryman."

F. A. Bartlett, Tree Specialist, Stamford, Conn.—"The finest acquisition in years. Winter of 1917-18 killed all my varieties *except La France.*"

Wm. Ziegler, Great Island, Conn.—"La France 8-ft. canes loaded with large clusters. Shall discard all other varieties and grow only La France."

J. B. Cobb, Stamford, Conn.—"Produces large crop for almost four months. Consider La France 'King of Raspberries.'"

Now's the time to order
Supply is very limited

Plant La France early this spring and have berries the first days of July! But order ***now.*** Twelve plants—a reasonable first planting—delivered to your door for $20. Six for $10.50. Single plants, $2, postage paid. (Not more than two dozen plants to any one customer.)

JOHN SCHEEPERS, Inc.
2 STONE ST., NEW YORK CITY

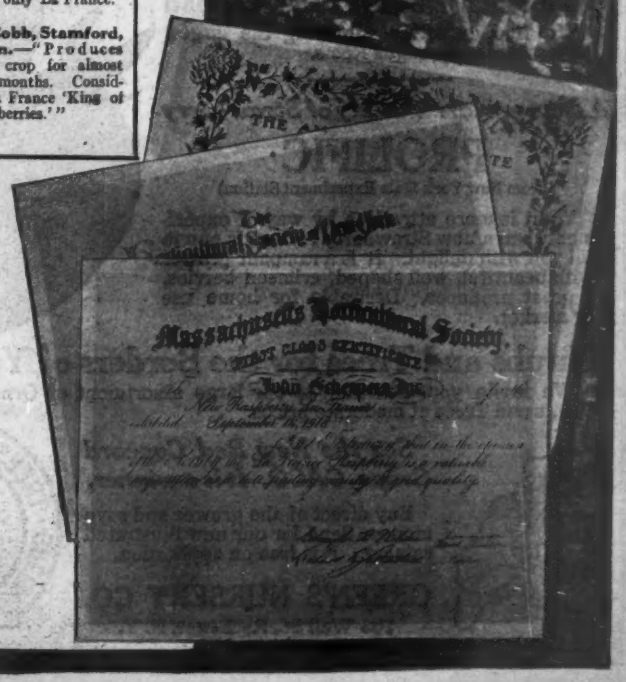
Nurseries—Sound Beach, Conn., and Brookville (Glen Head P. O.), N. Y.

Write for booklet on "La France Everbearing Raspberry." Includes additional expressions from noted horticulturists, etc.

La France First-Class Awards

Massachusetts Horticultural Soc.—New York Florists' Club—xHorticultural Soc. of New York—xMorris County Horticultural Soc.—xTarrytown Horticultural Soc.—The American Institute, New York—Nassau County Horticultural Soc.—Fairfield and Westchester Horticultural Soc.

xAnd Silver Medal. Also other Show and Fair Awards wherever exhibited.



Nursery Company

ROCHESTER, N. Y. *The Old and Reliable*

Proved and Tested. Forty Years' Experience. Four Nursery Farms.

In This Tree Famine we have reserved for those patrons who are depending upon us for their supplies the following list of varieties of Apple Trees grown from bearing trees:

American Blush	Jonathan	Stayman's Winesap
Baldwin	King	Transcendent Crab
Blenheim Orange	Maiden's Blush	Wagener
Delicious	McIntosh	Wealthy
Duchess of Oldenburg	Northern Spy	Winter Banana
Green's Improved Baldwin	Red Astrachan	Wismer's Dessert
Grimes' Golden	R. I. Greening	Yellow Transparent
Hubbardston Nonesuch	Rome Beauty	

We cannot hold the above valuable varieties for you long. If you want any of these trees send your order quickly.

SAVE BIG MONEY

No agents employed. Apple trees, pear, cherry, plum, peach, quince, nut trees, grape vines, gooseberry and currant plants, raspberry, blackberry, strawberry, shade trees, shrubs, vines and roses for sale. Largest and oldest nursery selling

DIRECT TO PLANTERS

40 Years' Experience. $100,000 Capital. Four Nursery Farms.

Dwarf Pear Trees

We have a full supply of DWARF PEAR TREES of the leading varieties. DWARF PEAR TREES are among the most attractive features of the home garden, bearing fruit soon after planting, especially desirable when planted three feet apart in a row across the garden in what I call a Dwarf Pear Hedge. This is the reason why we have propagated Dwarf Pear Trees freely in past years and have a larger supply than most nurseries. Perhaps the best bargain we offer next to small fruits and ornamentals is in the price of Dwarf Pear Trees.

Dwarf Apple Trees For Sale

While DWARF APPLE TREES cannot exceed Dwarf Pear Trees in abundant and early fruiting, they are immensely attractive. No home garden should be without a few DWARF APPLE TREES even if they are grown only for their beauty, but they will produce heavily and fruit early soon after planting.

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Asparagus Roots by the Carload

We find ourselves supplying the largest dealers with Asparagus Roots.

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PROLIFIC

(From New York State Experiment Station)

What is more attractive by way of experiment than a new Strawberry? Here is one to fill you with delight. It is a rampant grower with beautiful, well shaped, crimson berries, a great producer. Desirable for home use or market.

Shrubs and Trees for the Borders of Your Lawn

We invite your attention to our large assortment of Ornamental Vines, Plants and Trees at moderate prices.

See the New Red Concord Grape, CACO. It is a winner.

Buy direct of the grower and save money. Send for our new illustrated catalog. It is free on application.

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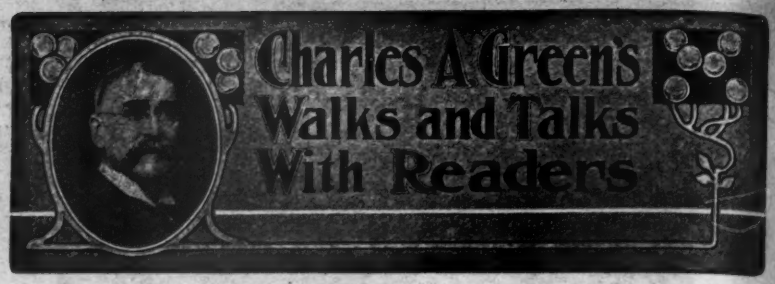


ARE NUTS THE BEST OF ALL FOODS

There are so many classes of food from which man may select that I would not feel like saying that any one is better than all others, yet I am inclined to select nuts as a high ideal of human food. I am led to this thought on being presented with pecans fresh from the orchards of Louisiana. They are of large size with thin shells and thick, fat, well flavored meat.

One reason why they may be placed high as an article of food is that they are perfectly clean and free from germs of disease, whereas most of the foods consumed by humanity do contain poisons, germs of disease or are uncleanly. I say uncleanly, for how is it possible for milk, cream, butter, bread, cakes, pies, candies and other foods to be absolutely free from deleterious substances. Can you milk a cow, no matter how particular you may be, or how clean the cow, without getting a particle of dirt into the milk pail? You can approach nearly to the point of cleanliness by taking excessive pains, but think of the carelessness of most milkers and the dirty condition of the cow and of her abode and of the milker and his soiled hands and clothes. But in the nut you have food hermetically sealed, the meat of which has not been exposed for a moment to soiled hands, soiled clothing, or to the germs and dust that float about continuously in the air.

But there are other arguments in favor of nuts. I know of nothing eatable that is more tempting than nuts. There are few articles of food so nourishing.

"But how about their digestibility?" I am asked. Years ago I was told by my physician to be wary of nut eating. I told him that nuts had been an important article of my diet since childhood and that I could recall no instance where they were the cause of indigestion and that I suspected that where nuts did seem to produce stomach disorders it was when they were eaten as the final course after a Thanksgiving or Christmas feast.

A serious drawback to nut eating for many people is their expense, and yet I believe that English walnuts at 25 cents a pound are as economical as porterhouse steaks at present prices. The pecan nuts which I have alluded to cost over 90 cents per pound, but those of smaller size can be bought at about the same price as English walnuts. The nuts that my friend gave me came to him cracked in a scientific manner. The cracking machine pressed upon both ends of the nuts instead of upon the sides as usual, thus freeing the meats without breaking them in the least. The objection to buying cracked nuts is that they will not long retain their freshness of flavor.

MIXING WITH MEN

Are you a good mixer? By this I mean are you socially inclined, or do you make the most of opportunities to get into conversation not only with the people you know slightly but with entire strangers?

Probably you are not a good mixer for the majority of men are not inclined that way.

When you go into a restaurant for dinner or supper, how do you treat the man seated by your side or opposite you at the restaurant table? It will be safe to bet that you say nothing to this individual but simply look at him occasionally when you find it impossible to appear to be interested in something back of him at the other end of the room. Such conduct as this is not rational. If you should meet this man seated opposite you at dinner in the wilds of Africa, or among the icebergs of the arctic regions, or even in a European city, you would on assuming that he was an American, almost feel like throwing your arms around his neck and hugging him. How is it then that when you have so much better opportunity to exchange civilities with a stranger at the local dinner table you do not avail yourself of the opportunity?

Surely we have to be governed somewhat by the makeup and general appearance and conduct of the stranger. Sometimes a man is so repellant there are few who could enter into conversation with him unsolicited, but my experience is that the average man is far more approachable than we assume. How many men there are who on first acquaintance seem to be cold and uncongenial, who after years of acquaintance develop into cordial friends?

TIMBER LAND FOR ORCHARD

Mr. Charles A. Green: I have a tract of land of about ten acres, which six years ago was covered with chestnut timber. The trees were cut at that time but the stumps still remain. The land is on an elevation, slight southern exposure, open on all sides with the exception of the west where some of the chestnut trees are still standing. Would it be advisable to plant a peach orchard on this site, and if so, would it be absolutely necessary to pull the stumps, provided the trees of the orchard could be properly cared for. C. H., Pa.

C. A. Green's Reply: The elevated site would seem to be favorable for the planting of a peach orchard and you are in about the right latitude for successful peach growing. I have never advocated the planting of any kind of orchard on land encumbered by stumps, and particularly by chestnut stumps, for the reason that where a chestnut tree is cut down the roots are almost certain to send up shoots, keeping the stumps alive and thus impeding cultivation.

When H. E. Van Deman was my associate editor of the AMERICAN FRUIT GROWER, I visited with him a Michigan fruit grower who had planted an apple orchard in a clearing of the woodlands which had recently been cut down. The owner had attempted to cultivate but the wild growth of berries and forest shrubbery had been so vigorous as to submerge the apple orchard which was hardly visible, and yet I could see here and there an apple tree that was making some growth. Peach trees more particularly than other kinds of trees require good cultivation, therefore do not plant them until the field is in such shape as to be easily and thoroughly cultivated and thoroughly prepared before planting.

I am often asked about planting an orchard in fields that are occupied by large rocks or boulders to such a degree as to make cultivation difficult. My answer to such inquiries about rock-infested fields is that they often are remarkably successful for orchards of the apple or pear. Such rocky land is liable to be very fertile. The rocks themselves add fertility to the soil and have a tendency to keep the ground moist. An orchard planted on such a rocky field if cultivated to an extent of three or four feet in diameter around each tree, or mulched liberally with any kind of strawy litter, may be a great success, but not so a field infested with stumps, many of which are alive. If the stumps were nearly all dead and new shoots were not springing up continually over the field, such a plot might be successfully planted to apple and pear but not so successfully to the peach.

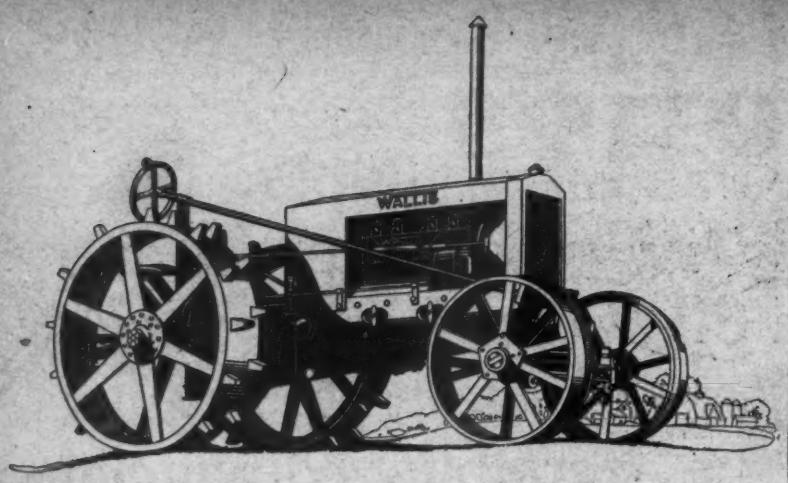
A single county in Virginia, Frederick County, lost this year, according to reliable authorities, $1,000,000 worth of fruit from cedar rust. H. F. Byrd, one of the largest apple growers in the state, is heading a movement to have all red cedars within two miles of commercial orchards, destroyed.

It does not just happen that the Republic is the largest-selling truck in the world today. It goes back to such basic things as the Republic's performance, its wonderfully rugged strength, and real economy. More than 60,000 shrewd farmers and business men have now bought Yellow Chassis Trucks because the Republic convinced them that it actually does better hauling at less cost.

REPUBLIC TRUCKS

REPUBLIC
Yellow Chassis
TRUCKS

Republic Motor Truck Co. Inc., 934 Michigan Avenue, Alma, Michigan



TODAY the trend of tractor thought is strongly toward the Wallis—the champion of quality and engineering excellence. This is because of Wallis performance, and because the average Wallis owner is enthusiastic over what his Wallis does for him.

He finds in this quality tractor the machine that meets his every demand. Power is there in abundance; and dependability which insures unfaultering service is a characteristic that wins his admiration.

The realization that his Wallis is built to stand the strains—that it keeps on going from one season to another, with a singular freedom from trouble—wins his heart. And naturally, in his enthusiasm he tells his experiences to those he meets.

So it is the news of Wallis performance is carried. So it is that men everywhere know of this quality tractor, which has supplanted bulk and heavy weight with compact design and fine engineering.

And today—as evidence by the steadily increasing demand for Wallis Tractors—the American farmer is voting for the assurance, dependability, durability and economy that this Wallis advanced engineering brings.

If you want a Wallis, do not delay. See your local dealer or write us at once.

NOTICE: We want the public to know that the WALLIS TRACTOR is made by the J. I. CASE PLOW WORKS COMPANY of Racine, Wis., and is NOT the product of any other company with "J. I. CASE" as part of its incorporate name.

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WALLIS
America's Foremost Tractor

TWO DANGEROUS INSECTS
By Wesley Webb, Delaware

Among the insects that threaten the peach industry of Delaware are the oriental peach moth and the Japanese beetle. During 1918 the United States Bureau of Entomology sent two men who nearly covered Delaware in search of the oriental peach moth, and while they found some injury that might have been caused by this insect the insect itself was not found.

During the past season the northern end of the state was again inspected by R. Earle Dickey of Stanton, Delaware, and Francis O'Rourke of Newark, graduates of Delaware College, who found some suspicious injury but still failed to find the insect. A close watch will be kept upon this pest and if found steps will be taken to prevent its spread.

CROSS-POLLINIZATION NEEDED

As to that item—a "worth-while seedling," cherry—on page 16 of your issue of November, I found out years ago that most varieties of the finer cherries in cultivation are not self fertile, and need cross pollinization.

Also that a wild or seedling tree is much more prepotent, having greater power of reproduction than the finer-bred sorts. This principle applies, I have no doubt, in all forms of life, animal or vegetable.

I had a block of the finer kinds of the cherry that refused to set its fruit, but after coming within the influence of the bloom of a few wild trees became exceedingly productive.

RECENT ORCHARD SALES

A tract of 24 acres, known as the Yeakley Orchard, near Winchester, Va., has been bought by James R. DuShane from his father Major J. D. DuShane, at a price of about $5,000. James R. DuShane and Howard Cather have also acquired a fruit farm in the same locality for $50,000.

Homer Horner paid $270 per acre for the home farm of the late J. H. Catrow of West Virginia. The farm contained 212 acres, 37 acres being in orchard. Charles Catrow bought a second farm from the same estate, giving $230 per acre for 120 acres containing a 25 acre orchard. The third tract of the J. H. Catrow estate, comprising 136 acres including a young orchard of 12 acres, was bought by Henry Catrow for $183 per acre. All the sales were made at auction.

The Julian Orchard Company holdings, in Placer Co., Cal., comprising 1,035 acres, have been bought by Charles Virden, manager of the Fruit Distributors of Sacramento, Cal. The greater part of the holdings is in bearing orchards, with some land set to young trees and some ready for planting. The deed carries $275 in revenue stamps, which gives some idea of the sum paid, though the exact figures are not mentioned.

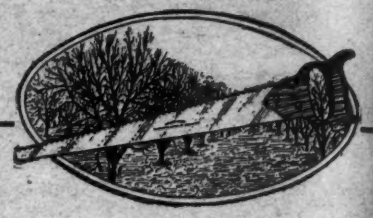
The Turnois farm, Souds, N. Y., contains 75 acres and was recently sold to Jesse Rogers. A special interest attaching to the farm is that there are upon it today three apple trees over 100 years old and still bearing. In 1811, William Delano of Maine, came in on horseback bringing some apple seeds which he planted. They were the first in the county, and the three veterans still standing are survivors of the original trees.

The 13 acre orange grove of R. J. Laidlow, California, has been sold for more than $50,000, according to the San Gabriel Sun. This seems less extravagant when we learn that the crop last year sold for $14,100, but even so, it wakes us up to read of any fruit land selling for more than $3,846 per acre.

Alexis E. Frye, writer and publisher, has sold an orange grove of 140 acres in the Highland district, for $225,000. Such large figures suggest that the deal was financed by a syndicate, which is said to have been the case.

Eight Russets were found in a bunch on a Seek-no-further apple tree, by a picker in the orchard of J. F. Osborne, Ontario, Canada. The Russets were true to flavor and color and graded number two in size and number one in condition. The Russet orchard was over an acre distant from the tree of Seek-no-further which bore the freak apples. The tree had never been grafted.

ATKINS SILVER STEEL SAWS for Pruning



Pruning Pays Profits

Today trees are pruned for results, not for looks—for increased profits.

Periodical thinning out and sensible heading back have accomplished wonders.

Success in pruning can be achieved by using the right tools —ATKINS Pruning Saws.

Atkins A A A Pruning Saws are made of the famous Silver Steel, the same that has made the name Atkins stand for the very highest in saw value.

Ask for them at your dealers.

Write Today for this book

"Pruning Pays," a book on proper care of fruit trees, describes in detail the correct method of pruning. The suggestions may help you increase your profits from fruit bearing trees. It's *free;* ask for it.

E. C. Atkins Co., Inc.
Makers of Silver Steel Saws and Tools
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Millions of Strawberry Plants

AROMA GANDY KLONDYKE DUNLAP, etc.

These plants are New plants grown on New land, are thrifty and first class in every respect.

Send for Circulars.

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Imp. Dwarf Blueberry (Huckleberry)

LARGE, luscious—almost seedless. Yields abundantly without special culture—very hardy.

Also the best Strawberries, Raspberries, Blackberries, etc. Fruit, Nut and Ornamental Trees, Shrubs, Vines, Roses, Hedge Plants and Garden Roots. Our descriptive Catalog No. 1 gives details. It is FREE.

J. T. LOVETT, Inc., Box 134, Little Silver, N. J.
Berry Specialists for 42 years.

CLOVER AND TIMOTHY BARGAIN

$9.00 Per Bu.

Red Clover and Timothy mixed—the standard grasses; cannot be surpassed for hay or pasture. Contains good per cent clover, just right to sow. Thoroughly cleaned and sold on approval, subject to government test. Ask for this mixed seed if you want our greatest bargain. Have Pure Clover, Sweet Clover, Timothy and all Field and Grass Seeds. Don't buy until you write for free samples and 116 page catalog.

A. A. BERRY SEED CO., Box 888 Clarinda, Iowa

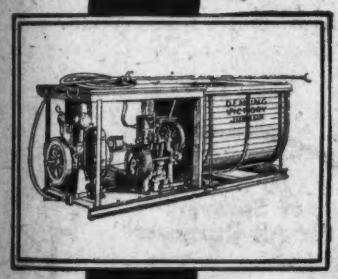
ROSES of NEW CASTLE

Are the hardiest, strongest growing freest blooming roses in America. We are expert rose growers and our prices are right. Our book for 1920, "Roses of New Castle" tells how to make rose growing a success and gives all information that you need. Send for your copy today—a postal will do.

Heller Bros. Co., Box 220 New Castle, Ind.

25 Varieties of Sprayers

Deming "Samson" Spraying outfit, mounted ready for use. Easiest working hand sprayer on the market. Will develop 150 to 175 lbs. pressure while supplying two leads of hose.



Deming "Victory" Power Rig 3 H. P. Engine; 200 gal. tank; capacity 8 gal. per min. Will easily keep 2 "Comet" Spray guns in action. Mount on any farm wagon truck.

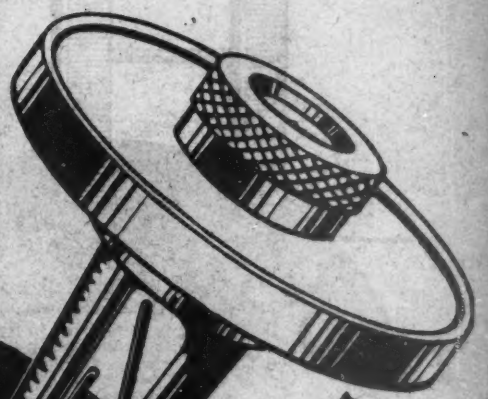
DRENCH your trees more thoroughly, cover the ground more quickly, use less men on the job.

Increased spraying efficiency—that's the way to bigger profits!

The right sprayer to fit the job—that's the answer!

From the small Deming bucket sprayer to the 200 gallon "Victory" Power Rig Deming sprayers are built for s-i-m-p-l-i-f-i-e-d spraying.

With 25 different sprayers in the Deming line it is an easy matter to select the most efficient and most economical type to meet all spraying conditions.



RUBBER DRIP SHIELD

THE Deming "Comet" Long Distance Spray Gun for use with power sprayer does the work of two men with spray rods. From three to four times the work can be done with this gun than with the ordinary spray nozzles. The topmost branches can be covered from the ground. A slight turn of the wrist produces all the graduations from a wide mist covering an arc of about 90 degrees, to a coarse long-distance spray. Quick acting in control—no waste in going from tree to tree. It is light, neat, strong and simple in construction

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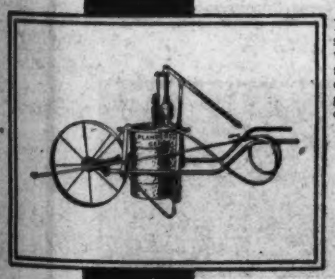

Deming "Planters Gem" sprayer. A handy wheelbarrow type sprayer that serves equally well for garden or small orchard work.

HAND AND POWER SPRAYERS

SPECIAL OFFER

Deming "Farmers' Friend" Sprayer, a convenient outfit for field, vineyard, orchard spraying, whitewashing or disinfecting. A simple attachment (extra) converts this sprayer into an excellent 4-row field sprayer. The materials for building this outfit were purchased at pre-war prices. Unfil further notice *we will sell the outfits now in stock at the special price of only $48.* The cart alone without barrel or spray pump is worth the price. The "Farmers' Friend" is fully described in our 1920 catalogue. Don't miss this chance to secure a high grade standard outfit at an unparalleled price.

The Deming Co.

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Hand and Power Pumps for all Uses.

Price **$48.00**

This 40 page book illustrating Deming Hand and Power Sprayers for every purpose will be mailed free. With it comes a concentrated spray calendar and mixture guide that is a most valuable reference for every grower. Just use the handy coupon.

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Gentlemen:—Send your 1920 catalogue and spray calendar and guide to proper mixtures to

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HAYES

How to Kill the Pests and Stop Your Losses

SEND THE COUPON on opposite page. Read these *new* facts on spraying now. You can't expect your apples, peaches, pears, plums, grapes and other fruit to live and produce profitable crops if infested with San Jose Scale, Codling Moth, Scab, Blotch, Bitter Rot and other deadly, life-sapping diseases and pests. You can't expect your potatoes to develop and grow—your hogs to put on money-making weight—or your Hens to lay—if eaten up and tormented by bugs, mites and lice. Authorities say that the deadly ravages wrought by these ruinous, destructive pests cost farmers untold millions each year.

Spraying Will Stop Your Losses

Learn how spraying will enable you to drive these pests from your farm. How spraying will save you part of this tremendous loss and add hundreds—even thousands—of dollars to your profits each year. Send the coupon for all the facts now.

* * * *

There is a type of Hayes Sprayer for Orchards, Gardens, Field Crops, Vineyards, Nurseries, Trees, Potatoes, Cotton, Flowers, Alfalfa, Sugar Beets, Disinfecting Hogs and Poultry, Whitewashing and Cold Water Painting. Whether you need the great Triplex Fruit-Fog Power Sprayer or the smallest Garden Automizer, you'll find it in the Hayes Line.

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Fill out and mail the coupon on opposite page now. Tell us how many trees you want to spray and how old on the average. Also other uses you have for your sprayer We'll tell you where and how you can get the style of Hayes Sprayer best suited to your needs, and its price. We'll also send our Big New Book of Hayes Sprayers and our Valuable New Spraying Guide FREE. Send the coupon today.

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The Hayes Compressed Air Outfit sprays Garden quick, easy and cheap

The Hayes Wheel Barrow Sprayer is ideal for spraying Hogs

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"America's Foremost Spraying Apparatus"
Sprayers for All Purposes

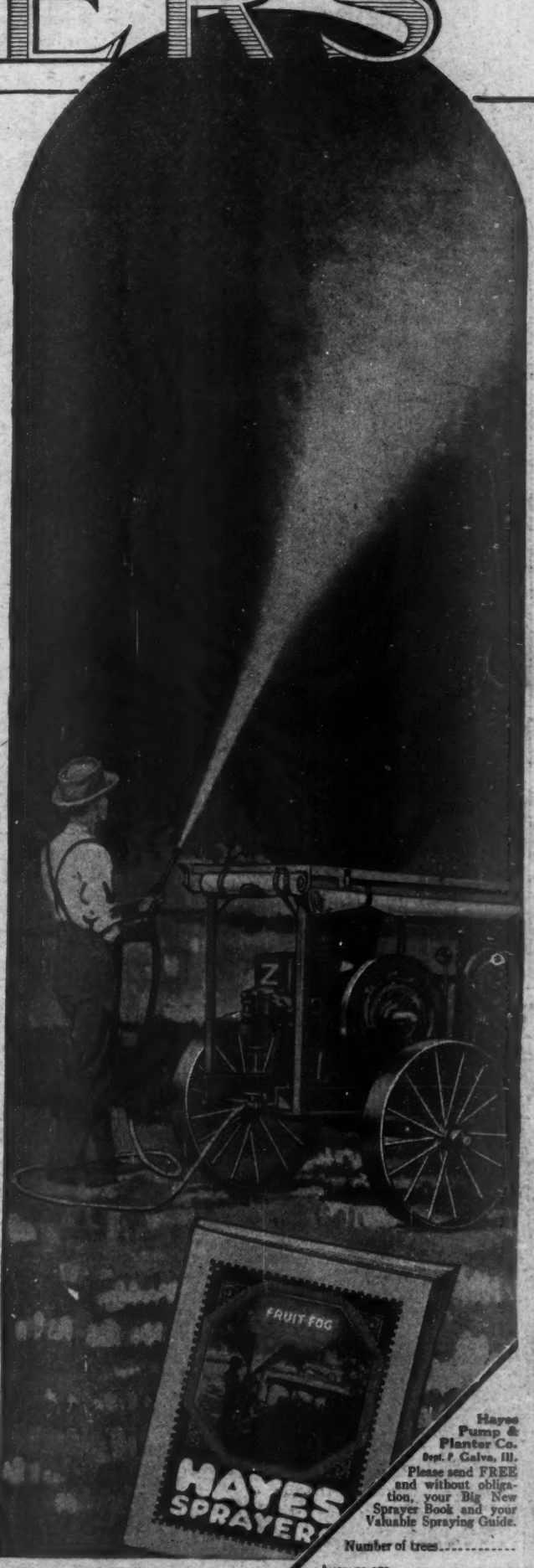
(37)

FRUIT-FOG SPRAYERS

Send Coupon for Secret of "Fruit-Fog" Spraying

LEARN why Fruit-Fog is the greatest boon to Fruit Growers ever discovered. How mighty yields that are almost unbelievable are being produced in Fruit-Fogged orchards. This is because Fruit-Fog—the vaporous super-spray—is the only spray *fine enough* to seek out and kill the *hidden* pests.

These *hidden* pests are the millions of insects that infest the microscopical niches and crevices in bark, buds and foliage, where no heavy, coarse, low-pressure spray can reach. These hidden pests cost fruit growers untold millions each year. They sweep away fine fruit worth fortunes in a single season. Yet Fruit-Fog will *exterminate* them. Fruit-Fog will add 100% to 5,000% to your yield and your profits this year. Send the coupon and learn *all* the facts.



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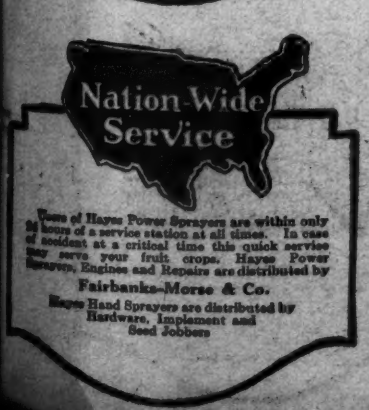
Fruit-Fog
Gun
World's fastest spraying apparatus. The only gun which combines great speed with the thoroughness of Fruit-Fog. One man handles capacity of big Power Sprayer. Simple twist shoots long spray to top of tallest trees, or wide spray for close-up work, or shuts off light—preventing waste of solution between trees. Guaranteed. Write for details.
Hayes Hand Barrel Spray Pump
Hayes Platform Duplex Hand Sprayer
Hayes High Pressure Triplex Power Sprayer with truck


Nation-Wide Service
Users of Hayes Power Sprayers are within only 24 hours of a service station at all times. In case of accident at a critical time this quick service may save your fruit crops. Hayes Power Sprayers, Engines and Repairs are distributed by
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Fruit-Fog is produced by Hayes *guaranteed* 300-lb. high pressure and the Hayes Scientific Nozzle. Because of its *vapory fineness*, Fruit-Fog has wonderful *adhering* power. No drops form—no solution wasted—no buds or leaves knocked off—as with heavy, coarse, low-pressure sprays.

Hayes Fruit-Fog Sprayers are skillfully designed and finished. Every part is positively standardized. They give enduring service and greatest efficiency under high pressure. To insure the best possible engine service, we have selected the famous Fairbanks-Morse "Z" Engine after countless comparative tests.

Valuable Spraying Guide Sent FREE

Send the coupon for Big Book FREE, which pictures and describes the Fifty Styles of Hayes Sprayers. Also for our valuable FREE Spraying Guide. See why the deadly pests that infest your farm *cost you more* each season than *several* Hayes Spraying Outfits. Learn how to *stop these losses*. How to recognize and kill *every pest!* What solution to use—how to mix it—how and when to apply it. The Book and Guide are worth hundreds of dollars to any Farmer or Fruit Grower. In sending coupon, please tell us how many trees you have and how old on the average. Also other uses for your sprayer. Send coupon today.

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Department P Galva, Illinois

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Dept. P, Galva, Ill.
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Number of trees.....
Average age.....
Other uses.....
Name.....
P. O.....
State..... R.F.D.....

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MECHANICAL perfection—sturdy construction—plus power—right price—all these combine to make the Fairbanks-Morse "Z" America's Master Farm Engine.

On over 250,000 American farms the "Z" is daily demonstrating its superiority. More firmly than ever its unquestioned supremacy is becoming established. Backed by Fairbanks-Morse quality and its own reputation for unparalleled performance, the "Z" is the one engine for any farmer to buy.

Let your dealer show you why you should have a "Z." You will know then why over a quarter of a million progressive farmers selected it after comparing it with all others. Two hundred Bosch Service Stations cooperate with Fairbanks-Morse dealers in rendering real service to "Z" owners.

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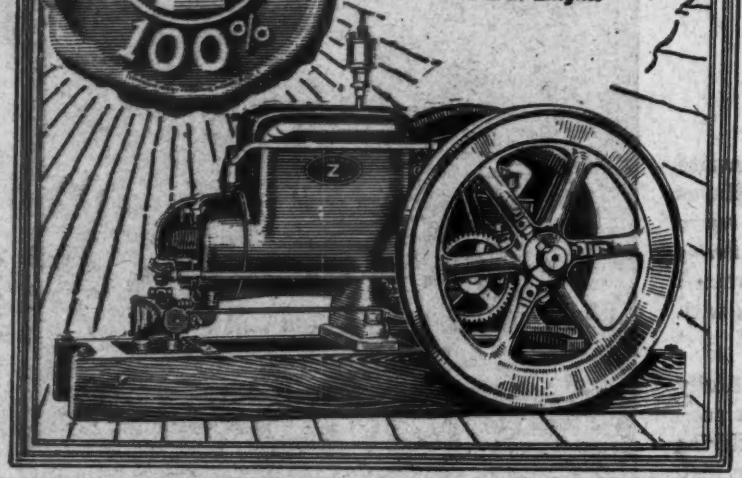

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Planet Jr. Seeders, Wheel-Hoes and Cultivators will enable you to do as much work as three to six men using ordinary, out of date tools. They cultivate thoroughly, rapidly and properly. Planet Jr. tools are made with scientific accuracy, and of the best materials. Fully guaranteed.

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S. L. ALLEN & CO., Inc.
Box 1107 G
Philadelphia

No. 25

Storage Cellars of Concrete

By E. K. Borchard, Pennsylvania.

IT IS needless to point out to the up-to-date fruit grower the value of a good storage cellar for taking care of products of his orchards. On practically every farm there is the need of a good underground cellar. In cold climates they afford the best and cheapest winter storage for fruit and vegetables. The logical material for constructing such underground cellars is concrete, because it is permanent, low in first cost, does not rot out and is a good insulator.

Directions for Building

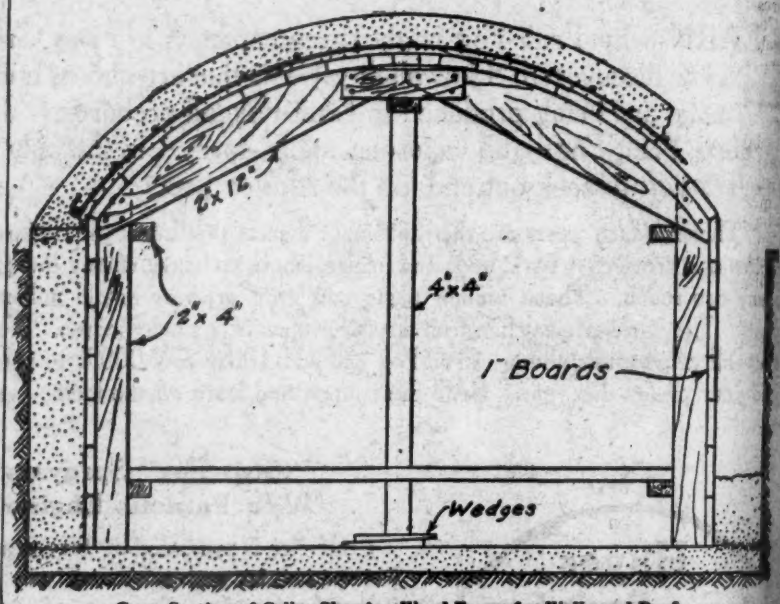
A popular size for a small farm is a cellar 10 feet by 14 feet inside measurements, with a self-supporting arch roof 5 feet above the floor at the sides and 7 feet 8 inches in the center. The walls are all 8 inches thick. Therefore the excavation for the cellar should be 11 feet, 4 inches by 15 feet, 4 inches, and to the depth desired, which is usually 5 feet. At one end the earth should be cut out to provide a flight of steps which may be of either concrete or wood.

The forms as shown in the drawing are made up of 1 inch siding nailed to 2 by 4 uprights spaced 2 feet apart. The floor of the root cellar should be 4 inches thick, and it is best to lay this floor first before proceeding with the sidewalls. Mix the concrete for the floor one part Portland cement, two parts of sand and four parts of crushed rock or pebbles.

After the floor is laid, brought to proper grade and floated to a good finish on top, it is allowed to harden for a day or two until sufficiently strong to bear the weight of the side forms which are set up on the floor. Before this is done, however, the surface of the floor upon which will rest the side walls is thoroughly roughened and cleaned off so as to present a surface to which the concrete of the side walls will adhere. After the forms are set in place the concrete of the side walls is carefully placed so that no dirt from the side of the excavation is knocked into the fresh concrete. Where loose sandy soil is encountered, it is necessary to have an outside form as well as the inside wall form, because the earth will not stand up firm enough to take the place of one form.

Over the door opening in the end wall two three-eighths inch steel rods should be placed, and bolts should be embedded in the concrete to provide later for holding the door frame on hinges.

After the walls have hardened for several days the roof may be built. The roof has a rise of 2 feet 8 inches so that a curved form should be constructed as shown in the drawing. For laying out the curved pieces for the roof form, choose a floor or bit of level ground. To one end of a string fasten a pencil. Tie the other end to a nail driven into the floor, with exactly 5 feet 11 inches of string between the pencil point and nail. The pencil will then scribe the correct arc of a circle on the boards. Brace the roof form well as shown in the drawing. The siding for the roof forms is 1 inch boards the same as for the side wall forms.



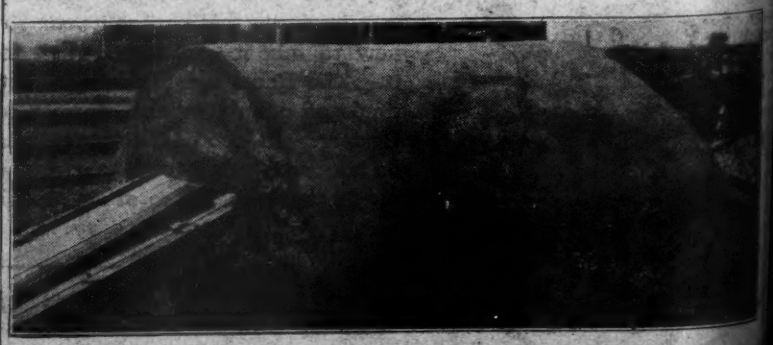
Cross Section of Cellar Showing Wood Forms for Walls and Roof

Before starting to place the concrete have prepared reinforcing bars bent to the proper curve of the roof. These bars are ⅜ inch in diameter and are spaced 6 inches apart. The same size bars are used running lengthwise the roof, and spaced 12 inches apart. Locate these rods as shown in the drawing, one inch up from roof form. Carefully roughen and clean the top of the walls and everything is ready for placing the concrete on the roof.

The roof should be 5 inches thick. Start at the eaves and deposit concrete on the forms, carefully working the concrete underneath the rods. Only medium wet concrete should be used so that while fresh it will not run down the slope of the roof. It should be well tamped while placing so as to get a good dense concrete. Do not stop for anything until the roof is finished. In two or three weeks the concrete roof will be strong enough to support itself, then the forms may be removed.

The materials required for a cellar the size given are:

Crushed rock	13 cubic yards
Sand	6½ cubic yards
Portland Cement	22 barrels
Reinforcing	206 lbs. ⅜ in. rods



A Small Fruit Cellar of Concrete—May Be Built with Arched or Flat Roof

Buy Your Cement Now

MANY of our readers contemplate doing more or less cement work during the coming season, in the way of foundations, silos, walks, fence posts, floors, etc., and to them a letter we have just received from a prominent cement manufacturer may be of value. This letter in part says:

"Here are the plain facts. For 1920 there is appropriated $633,000,000 for hard roads, on which cement will be the principal material to be transported. This is five times the volume of any previous year!

"Portland cement manufacturers are obligated to take care of road contracts next year, and if the farmer-consumer can be made to realize that by getting his cement requirements early in the season, he will not only be aiding in building good roads which will pull him out of the mud, but will also be assured of having the cement on hand when he desires to use it later on.

"Cement purchased in February and March, if stored in a dry place, can be safely used any time during the following summer. The car shortage of the past season has greatly curtailed the movement of cement and other building materials, and in view of the present situation, one can readily foresee that the supply of cars for the next season for moving this class of products will not be more numerous."

Cement is becoming such a necessary product in the construction of farm buildings, that in view of this timely suggestion from a cement manufacturer who is in position to know the exact situation, we are passing the information along to our readers in order that they may prepare for the shortage that is quite certain to occur. Buy your cement now.

MAKING PASTEURIZED CIDER

By Clark Allis, New York

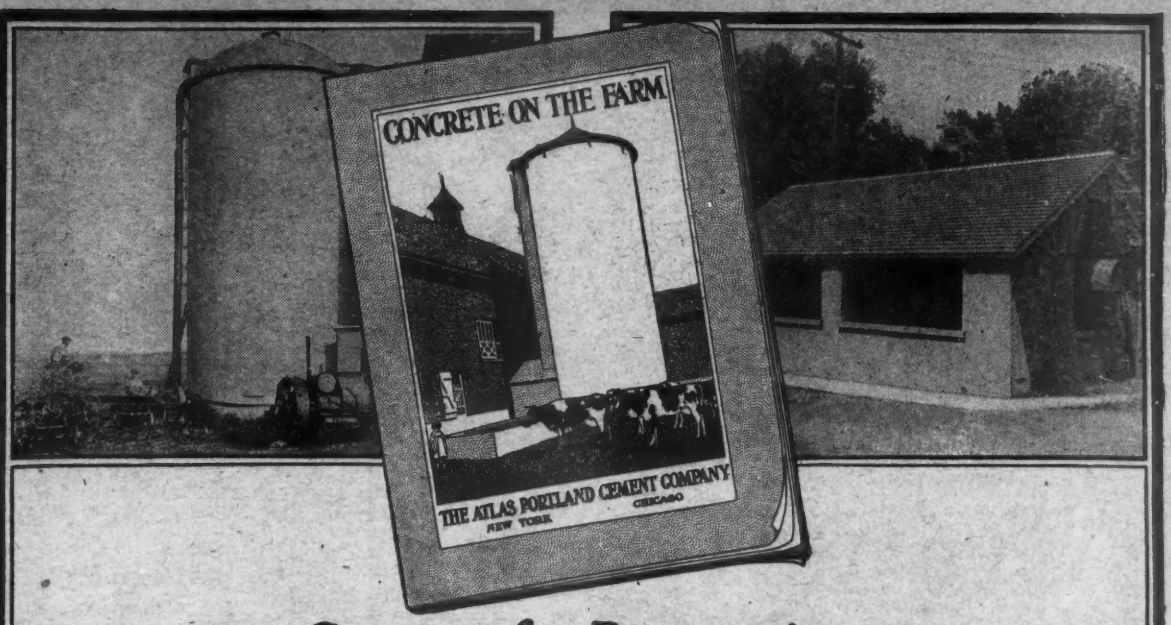
Things have been the slowest this year that I have ever seen them in the delivery of machines, and instead of making cider with a rush last fall, we are still working on it, and also perfecting our equipment. But when we are done we will put out the most wonderful apple juice (cider) ever imagined. It will be the first plant of its kind, and will make a brand of cider better than was ever produced.

Our cider apples are in cold storage at 30 to 32 degrees so they are holding well. We will use nothing but sound, ripe, mature fruits, no rots or leaves and no chemicals or preservatives.

We keep machines washed clean. From the press, the cider is filtered, then it goes into a big Sharples clarifier capacity 8,000 pounds per hour; then filtered through a bag to break up the foam. This machine makes it foam. Then it is pumped to a tank, and over to the rotary bottler, then to the capper. It is some cider! The pasteurizer turns it to a light golden color, beautiful to look at, but everyone says the taste beats it all.

We are building Van Aerman pasteurizers so as to run the truck with bottles into the machine. It took me a long time to evolve a truck that could be loaded and unloaded easily with the least amount of material to absorb heat while in the pasteurizer. As I now have it, it is a truck 2½ feet wide, 5½ feet high, woven wire and single iron construction, with pigeon hole for each bottle, arranged in two rows with the backs together so that the bottles may be slipped in from each side. The center of the truck is slightly lower than the sides, so the bottles will always stay in.

This year settles me for one thing, and that is "dust." It is no where near as good as liquid spray. In buying apples one has a chance to see what different growers produce, and while some careless sprayers have bum stuff sprayed (at) with liquid, it averages so much better than dust, I don't believe I will ever buy any apples again that are dusted alone. Dust is of value on red bugs, pear psylla and such things where one uses tobacco dust. But that is all I will use it for.

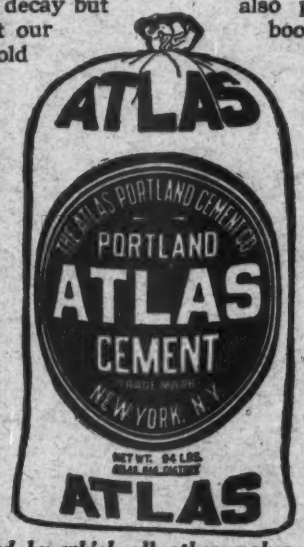


Concrete for Preservation

ATLAS Cement is the ideal farm building material—not alone for preservation of the buildings against fire, weather and decay but also preservation of their contents. Use the coupon below and get our books, "Concrete On The Farm" and "Concrete On The Farm in Cold Weather."

Right Now

A little forethought would have enabled you to feed your cattle silage in February. Make sure that next season you will be able to do it from a concrete silo in which green feed can be kept and fed to cattle throughout the entire winter.



Next Spring

Save money on artificial fertilizers by building a concrete manure pit from which the richest manure value—the liquid—cannot escape. Easily constructed by your farm help with a few bags of ATLAS, broken stone or pebbles, and sand, most of which may be found right on your own property.

"The Standard by which all other makes are measured"

The Atlas Portland Cement Company

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Please send me a copy of "Concrete On The Farm" and "Concrete On The Farm in Cold Weather" without cost or obligation. BS

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New Ohio Beauty Apple

Trees from the Woodlawn Nurseries are vigorous growers and bred-to-bear. Our 44 years of successful growing experience has been devoted to the production of thrifty strong rooted stock. We have the exclusive sale of the wonderful Ohio Beauty Apple.

The same time-proven dependability makes Woodlawn grown shrubs, flowering bushes and perennials safe investments. The moderate prices bring an individual and attractive garden within the most moderate means.

Our illustrated 1920 Nursery List contains valuable planting and growing information as well as a catalog of select nursery stock. Mailed on request.

Our vegetable and flower-garden seeds make thrifty, beautiful gardens.

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Saves power—strain—time—labor and digs deep, because made of the finest cutlery steel *forged* sharp. You need a

Clark (CUTAWAY) Double Action Disk Harrow

to make the most of your land and equipment. Once over is enough. The rear disks cut the furrows turned by the front disks and every inch of ground is evenly pulverized. Does more work—and is lighter draft.

Write to-day for full specifications and name of nearest dealer; also interesting, valuable free book "The Soil and Its Tillage." Now is the time to plan for bigger and better crops.

The Cutaway Harrow Co.
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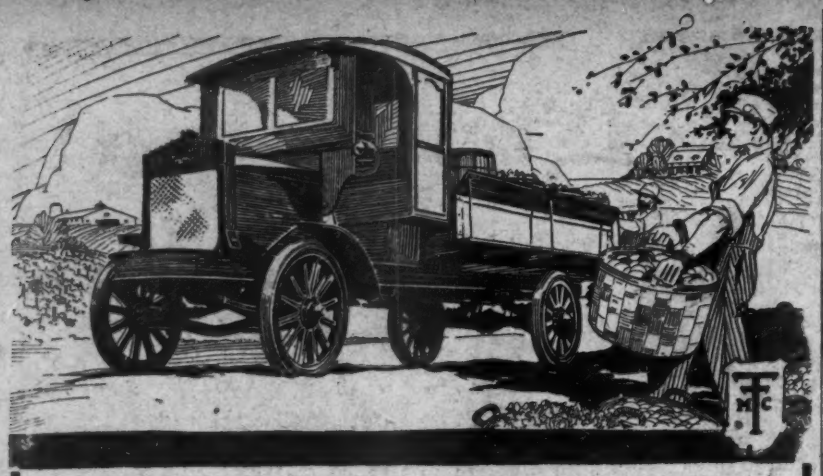

Traffic Truck

4000 LBS CAPACITY

Chassis

$1395

Factory

When You Buy A Truck This Spring

Farmers and merchants who measure values only by the return on their investments are seldom misled by the word "best" in any appeal inviting them to purchase a motor truck.

When deciding on which motor-truck you will buy this Spring, measure quality by the following three indisputable facts—the specifications—the carrying capacity and the price—which can only qualify "best" in a motor-truck.

The Traffic is built of standardized units and is ***the lowest priced 4000-lb. capacity truck in the world***—saving hundreds of dollars in first cost and maintenance cost. The Traffic hauls a 4000-lb. load 14 miles in one hour for 30 cents' worth of gasoline and it saves 50 per cent of the cost of hauling with teams.

A variety of bodies are built at the Traffic factory for equipping the chassis to carry all farm loads.

Traffic Truck Specifications:

Red Seal Continental 3¼ x 5 motor; ***Covert transmission;*** multiple disc clutch; ***Bosch magneto; Carter carburetor;*** 4-piece cast shell, cellular type radiator; drop forged front axle with ***Timken roller bearings; Russel rear axle,*** internal gear; roller bearings; semi-elliptic front and rear springs; ***6-inch U-channel frame; Standard Fisk tires, 34 x 3½ front, 34 x 5 rear; 133-inch wheelbase; 122-inch length of frame behind driver's seat;*** oil cup lubricating system; chassis painted, striped and varnished; driver's lazy-back seat and cushion regular equipment. Pneumatic cord tire equipment at extra cost.

Write for catalog today

Traffic Motor Truck Corporation

St. Louis, U. S. A.

Largest exclusive builders of 4000-lb. capacity trucks in the world

Small Fruits for Pleasure and Profit

By S. J. Bole

ANTHRACNOSE ON BUSH BERRIES

In the December number of the AMERICAN FRUIT GROWER we gave a brief description of and a control for each of four serious insects that prey upon blackberries and raspberries. Perhaps "serious" is not the word to use for these insects are only now and then bad and then only in certain parts of the country. Anthracnose, on the other hand, probably causes a loss in these two fuits of an amount many times greater than that caused by all of these four insects. Because more letters of inquiry as to this disease and its control have come to me during the past few years than concerning any other phase of the small fruit growing, I feel that the small fruit colums for this month should be entirely given over to this subject.

Anthracnose Worse on Blackcaps

As we have already intimated, this disease is the most serious of all the enemies of the blackberry and raspberries. Berry growing has greatly decreased during the past two decades and this decrease in the middle west has been due more to this one enemy than all the others put together. It is generally much worse on black caps than either blackberries or red or purple raspberries. While it affects the leaves, it does the greatest damage to the stem which becomes so devitalized the plant is not able to satisfactorily ripen its crop of fruit. The canes begin to die and the berries appear to dry up prematurely. The fungus develops upon the maturing fruit as well.

The appearance of this disease is that of gray, discolored spots in rows throughout the entire length of the cane. When severe enough the cane checks or cracks open in places. Sometime these growths appear as slight swellings, especially on red raspberry canes. This is especially true when the bushes are also affected with crown gall, a disease that is serious in rich prairie, clay or sandy loam soils. The simultaneous attack of both diseases often prostrates the canes and the owner is compelled to destroy his plantation.

Anthracnose is much more serious on some varieties than others. The writer has seen several cases of this. A few years since, the writer was obliged to plow under a plantation of Cumberland black caps while another variety growing side by side with it was but little affected. This other variety was ordered for the Munger but it may not have been that variety. The writer saw another marked instance of this in the breeding plots of black caps at the Geneva, New York, Experiment Station a couple of years ago. Two rows of hybrids, one being the reciprocal of the other were growing side by side and so close that their canes interlaced. One of these rows was seriously infected with the anthracnose and the other was quite if not entirely free from it. We feel that plant-breeders, nurserymen and growers should keep this point in mind as one of the positive methods of control in the future.

This disease like other fungus troubles is due to a microscopic plant, the roots or mycelium, growing into the canes between the plant cells and causing them to die. The mycelium do not grow deeply into the canes and generally kills only the bark and cambium layer. At the centre of the spots the mycelium threads unite to form a little club-shape stem on which the spores are borne. These spores mature and are readily carried down the stem by each rain. The spores germinate quickly in presence of water and new areas of infection are formed. The disease is much worse during cloudy and wet weather.

Strangely enough little work of an experimental nature has been done with anthracnose on berry bushes. In 1897, the New York Experiment Station published a bulletin by Prof. Paddock covering three years of experiments. Only two or three kinds of spray materials were used, including a dormant spray of either copper sulphate or iron sulphate followed by three or more summer sprays of Bordeaux. These New York results

(*Continued on page 46*)

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Seven Pound Portable

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More Hercules Stump Pullers in use than all others combined. Reason—they make big money for owners. No stump too big, no land clearing job too tough. One man and horse clear an acre a day. Pull stumps and turn loafing acres into crops.

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A. L. Rice, a prominent manufacturer of Adams, N... has discovered a process of making a new kind of p... without the use of oil. He calls it Powderpaint... comes in the form of a dry powder and all that is ne... is cold water to make a paint weather proof, fire... sanitary and durable for outside or inside painting... the cement principle applied to paint. It adheres to... surface, wood, stone or brick, spreads and looks like... paint and costs about one-fourth as much.

Write to Mr. A. L. Rice, Manufacturer, 19... Street, Adams, N. Y., and he will send you a free... package; also color card and full information showing... how you can save a good many dollars. Write today.

Kindly mention American Fruit Grower when writing to advertisers

Plant More Raspberries

By D. J. Wood, Nebraska

It seems to me, that the raspberry crop is not being developed as much as its merits demand. It is richer than either strawberries or blackberries. It has less waste in passing from producer to consumer, and is the best berry we have to hold its flavor in the can, dried or in preserves. It brings the highest price in the market and the supply never equals the demand. It seems to do well almost anywhere; in many places growing wild in the timber, especially in mountain country.

I have had good success in eastern, and central south part of Nebraska. It has no disease here yet to harm it. Its habit of a close growth, enables it to hold snow drift about its feet in winter that gives it moisture to produce its fruit, as it ripens early before the July heat. By planting in the orchard in the tree rows, this saves space, gives partial shade, which they like, and also helps hold the snow drifts for irrigation.

The only care I give, is to trim the canes back when two feet high by pinching out the terminal bud. This causes them to throw out branches which I seldom try to keep from rooting at the tip, because I need for myself, or can sell at a good price, all the roots I can save. I never have used any support for the canes, I cultivate often, as close as I can get to the row, and loosen up the soil between bushes with hoe or garden tool. I try to give them a liberal dressing of barn manure once a year.

I have the Gregg, Kansas, Pearl, Plum Farmer and Cumberland, all black varieties. The Gregg is the largest. The Pearl stands the winter best. It stood 20 degrees below zero last season, and is a drouth resister; what it lacks in size it makes up in quantity, and they nearly all ripen at once. Ten days will include most of the crop. The Plum Farmer is the poorest berry we have.

We find that a jam made half gooseberries, and half raspberries makes a most delicious spread, and a better jelly than either made alone. Thus utilizing the very tart sour crop of gooseberries and increasing the value of the raspberry crop. It is the best berry we have for home use or for the market, and should be more largely planted.

CURRANTS FROM GRAPES

The currant of commerce does not grow on currant bushes, as we would naturally suppose, but upon a special variety of grape vine in Greece, whence our supply of currants came before the war put a stop to the export trade.

Though efforts had been made for years to introduce this vine into the United States, poor results had been obtained until the United States Department of Agriculture took a hand and succeeded in producng good crops of currant grapes in California. It was demonstrated, that the two obstacles which had stood in the way of success heretofore were—first the phylloxera, and second the difficulty of getting the bloom to set.

By using phylloxera resistant stock which is congenial to the grafted vine and suited to the soil and conditions in which they are to be grown, it is said that the cultivation of these vines would succeed in any section of California where other grapes are now grown. To induce perfect setting of the bloom, and thereby secure both quantity and quality of grapes, the vines must be girdled by making two parallel incisions cleanly round the trunk, arms or canes of the vine, right through the bark, and then lifting out the bark between the two parallel cuts while the vine is in bloom.

The currant grape ripens very early and is harvested, cured and stored before the grapes for the raisin crop are ready. This provides a succession of work for labor in the grape growing sections. It is estimated that it would take from 5,000 to 8,000 acres to produce the 30,000,000 pounds of dried grapes annually imported and consumed in the United States hitherto. The home grown product would likely stimulate the demand up to even larger figures.

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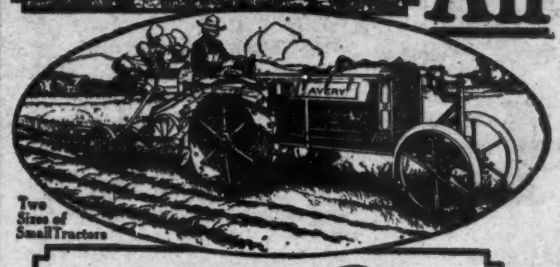

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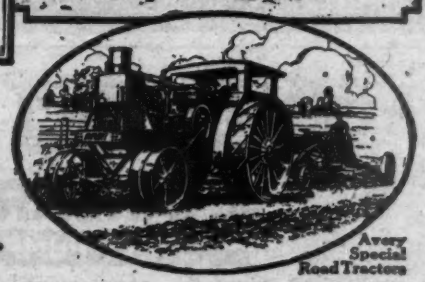

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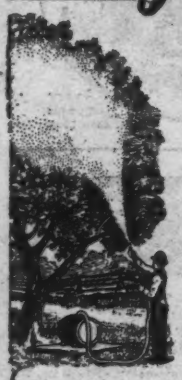

NOT only is it heavy artillery for the battle against bugs, germs and infection of all kinds, but it will wash vehicles, extinguish fires, apply whitewash, spray live stock, and serve as syringe in veterinary work. So many are its uses that every farmer needs it no matter what the equipment he may have now.

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Built throughout of brass which is not affected by ordinary chemicals. It is guaranteed for five years and will last a lifetime. Standard Spray Pumps are sold by hardware and seed stores. Sold direct where we have no dealer.

Price, $5.00. ($5.50 west of Denver, and in the extreme South).
Knapsack and other attachments extra. *Write for leaflet D*

THE STANDARD STAMPING CO., 355 Main St., Huntington, W. Va.

Fighting Frost in Oregon

(*Continued from page 6*)

treatment should settle beyond any question the effects of the firings, especially when it is considered that they were subjected to from ten to fifteen times as much as they would ordinarily get.

Slow Thaw Saves Fruit

This is not intended to convey the idea that the smoke and soot are always desirable. On the contrary it is hoped that we will find a more suitable fuel, or heater, as smoke and soot mean incomplete combustion with consequent loss of heat. However, there are times when the smoke is not only desirable but absolutely necessary to save the crop. An instance of this was during the night of March 25, 1914 (an unusually early spring). Contrary to all previous experiences, the temperature had dropped to 22° outside the orchard by 6.00 A. M. On account of the long duration and the excessive low temperature we had not sufficient fuel to keep the temperature up and before sunrise the blossoms and fruits were more or less frozen.

The sun rose in a clear sky but so dense was the pall of smoke over the whole valley that the thaw was very gradual and it was not till nearly noon that it got above 32°. The result was that the crops were saved, though, of course, there was some injury and some loss. In this case, where the heat was not sufficient, the smoke prevented rapid thawing and was our only salvation. This has again proved true during the season of 1918.

Preparations for Using Oil Pots

The first requisite for frost protection is sufficient tank room to store the fuel oil, if oil is to be used. The practice in the Rogue River valley is to have sufficient galvanized iron tanks, of from four to five thousand gallons capacity, placed on towers of just sufficient height to permit the filling of the wagon tanks from them by gravity. The oil, which is hauled from the railroad in wagon tanks, is pumped into the storage tanks during the winter or early spring.

Sufficient pots are on hand to place from two to four of the gallon pots to each tree. The pots are placed midway between the trees. In the case of small trees, where the pots are not under the branches, it is best to set them directly south of each tree, as our prevailing breeze during a frost is from the south.

This leaves a clear space for cultivation, spraying, or the moving of teams through the orchard, without danger of disturbing pots. But if the trees are close together, or large enough to spread over the pots, they are placed in the center of each square and with a row of pots all around the outside edge. Sufficient wagons, with galvanized iron tanks are provided to enable the orchardist to refill all the pots in one day if necessary. These tanks are fitted with molasses gates from which the oil is drawn into buckets fitted with spouts for filling the pots.

Electric Frost Alarm

A number of accurate self registering thermometers should be placed at convenient points in shelters throughout the orchard, the number varying according to the desires of the orchardist or the conditions.

Electric frost alarm and an electric danger signal are indispensable to scientific and economically efficient frost fighting. The latter instrument has been made and used for a number of years with absolute and unvarying success by the writer. The signal lamp consists of a small electric light globe so arranged, in connection with electric frost alarm thermometer, that when the temperature dropped below a given point (30 degrees) the light burned and showed through a green globe which could plainly be seen from any point in the orchard. This light was actuated by three ordinary dry cells.

The frost alarm was a standard make with two points. That is the thermometer had two points of contact and the alarm had a two throw switch, or button, so that it could be set at either of the points on the thermometer. The thermometer was placed at a height of about five feet and a half in an exposed position in the orchard. Wires were run to the house and attached to the alarm which hung at the head of the bed.

In the valley of the Rogue, during the frost season, there is stationed a forecaster from the United States Weather Bureau, who gives out timely warnings, and it is this aid which is invaluable to the orchardist. To those who keep no men on the ranch, it is particularly valuable to get the frost warning so as to allow time to have a crew ready early in the evening. However, the writer never needed the frost warning as it is generally understood. With a proper electric alarm it was no trouble to know when Jack Frost arrived and, to a certain degree, just how fast the temperature was falling. The value of the warning to one so outfitted, is to know as accurately as possible, how low the temperature may be expected to drop. This may readily be seen for, if the fight is to be of long duration and a low temperature, it will necessitate a sparing use of fuel in the early stages and concentration of all efforts just before dawn when, of course, the coldest point will be reached.

How the Alarm Works

With the above named instruments in place, the pots filled in the orchard, all was ready. The method followed for years by the writer is as follows: Everything being ready the switches are turned on in the signals in the field, and of course they remain dark. Connection is also made at the alarm. We will suppose that the alarm rings. As it is handy to the head of the bed the switch is turned over cutting out the first point, which is 32 degrees and the bell stops ringing. It is noted then that it is 1 A. M. and the temperature is 32 degrees. Confidence in the mechanism, and long use to such situations, permits one soon to fall back to sleep while the ever watchful sentinel in the orchard keeps his eye on Jack Frost.

Again the alarm rings and we know the temperature has just dropped below 30 degre and it is time to be up and doing. As apples and pears will stand a temperature of 30 degrees for about three hours, no particular hurry is necessary, especially as the clock has shown that it is 3:00 A. M. This means that it has taken two hours for the temperature to drop two degrees. Dressing and getting fortified for the struggle by a cup of steaming hot coffee from the Thermos bottle, we stroll out and take a look at the thermometer. It is a trifle below 30 degrees and dropping slowly. We wake up the men who tumble sleepily out of bed and, with torches in hand, soon join us at a corner of the orchard. By the time we have all reached there the green lights which have been burning, have suddenly gone out, the temperature has gone above 30 degrees. We light a couple of pots and sit around trying to keep warm.

Watchful Waiting

All about us on the valley floor we can see the twinkling lights of burning pots. They are wasting fuel and many, many dollars are going up uselessly in smoke. They are not equipped with the signal lamps and cannot know just what the temperature is doing. As we sit the green lights spring up again. They burn steadily for several minutes. The men get restless, but wait. Again the lights go out and the men light their cigarettes and take it easy again. Once more the lights spring up and burn steadily. Minutes pass and still they burn and the word is given, "Go to it, boys."

Every man knows exactly what he is to do. Lighting their torches one man starts down the first row and lights a pot to each tree. Another man is doing likewise in the second row. A third man has started down to Row 6, lighting a pot at each tree as he passes (these on the outside edge). Reaching Row 6 he lights a pot and then leaves one, making a pot to every other tree. When the men reach the far end of the rows they start down lighting a pot to each tree on the outside edge until they come to Row 6, which can be easily distinguished by the row of burning pots. Each man then misses three rows and lights the fourth as Row 10, 14, etc. They light every other pot and, when they have passed through the entire

(*Continued on page 50*)

Handling the Berry Crop

By M. D. Underwood, Illinois

IF SMALL fruits of the leading varieties and of first quality are produced, the picking, packing and marketing does not require quite so much attention in order to get fair returns, but "business skill" needs to be inserted into the operations. The quality is the first thing to be taken into consideration, second the manner of packing, and third the package used as the container. In every line there is good demand for a first-class article and the poorer grades go begging. This holds very true with berries.

One reason why markets become glutted is because they are flooded with fruit of an inferior quality. Berries that are small, green and knotty should never be placed upon the market as they not only bring very little return but injure the prices of others by causing a "glut." We never use any but the very best packages. While we have seen the time when we could have saved almost half the cost of packages used by buying the second grade containers, we know it is very poor economy to ship first-class fruit in second-class packages. Perhaps you have been unfavorably impressed with some men because they were unkempt, wore dirty clothes and seemed altogether careless about their attire. Perhaps the men were as good individuals at heart as the more dressy ones, but you were not attracted to them as readily as to the latter.

Just the same holds true with the matter of the packages in which food of any kind is shipped. Good berries could be put up in cracker boxes with splotches of dirt and stain on the outside, but they would be spurned on the market. Good, clean, neat and attractive packages, free from knots, always assist very much in getting the best price for the fruit. The packages should be secured and a good supply of crates and carriers made a few days in advance of the time they are to be used.

How to Pick Berries

Dry goods boxes make excellent picking crates. In harvesting the fruit it is best not to allow small children to pick, as they usually pick with one hand and hold the box with the other and, as one hand becomes tired, they will change the box to the other, thus staining the box badly. It is better to get experienced pickers, getting the satisfactory ones that picked last year if possible. They know just how the work ought to be done and much valuable time will be saved by the packers at the shed. Of course all the boxes should be filled well but not overfilled. The boxes should be about level full when they arrive at the market. To have them thus it will be necessary to have all the holes filled up well with nice fruit of nearly uniform size.

Berries should not be allowed to remain in the sunshine after they have been harvested. When they are so exposed the blackberries turn red and raspberries become soft, thus going on the market in a very poor condition. Berries that were rained on after they became ripe should in no case be shipped.

Marking the Crates

When the crates are filled they are of course nailed up securely and the name and address of the grower stamped thereon with a legible rubber stamp, and the name and address of the consignee stamped on the end of the crates. Marking on the ends is much better than on the tops, for this enables the transfer men to read them easily and quickly thus saving time and the possibility of their being miscarried or delayed.

It is necessary to use much care in hauling the berries to the station. One who has a motor vehicle is much better fixed for hauling the fruit than the one who has not, of course. If the haul is any considerable distance and a wagon is used, the wagon box should have straw in the bottom on which to set the crates even if the wagon has springs, and no wagon without springs should be used in the transfer of berries.

Succeeds Where Other Fungicides Fail

Some common fungous diseases are not difficult to control under ordinary conditions. But then comes a season when a common disease is serious or a serious disease is widespread in its destruction. Such a season is the best test of a spray material.

Every orchardist knows the danger of an unexpected attack by a disease that ruins his fruit. He knows that ordinary precautions are not enough when this attack comes, and usually it is too late to take additional measures. This is why many of the best and most prosperous orchardists choose

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Averaged over ten years, fertilizer increased the yield by more than a ton to the acre each year. It not only paid for itself but brought an extra yearly profit of more than $30.00 per acre.

Fertilizer practically doubled the yield of peaches in West Virginia. It increased the yield of apples four and five and, in some cases, ten times in Ohio. It produced profitable results on fruits in Pennsylvania and Massachusetts.

Use fertilizer to get bigger crops of fruit and to improve its quality.

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One of These Will Fit the Conditions in Your Vineyard

Figures repres nt ammonia, phosphoric acid and potash in order named.

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4-10-6	Sand	3-10-4
4-10-4	Clay	3-12-2
4-10-2	Loam	3-12-0

To determine the right fertilizer for other fruits, use our Automatic Formula Finder. It will be sent to you free.

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Keith Bros. Nursery,
Box 503, Sawyer, Mich.

Small Fruits for Pleasure and Profit

(*Continued from page 42*)

show that the above sprays greatly aid in keeping a plantation free from the disease, but the injury to the foliage offsets this gain, the check plots yielding approximately as much as the sprayed plots. These experiments gave the grower but little encouragement.

More recent experiments in these directions have resulted in a very positive control and while the work was but roughly done, it would seem to offer a sclution to the successful control of this most dreaded of diseases. I am referring to the work along these lines done at the Michigan Agricultural College and published in bulletin form in 1918.

The first portion of this work was done during the years of 1914 and 1915 on a bearing plantation near Eaton Rapids. The variety was Plum Farmer and the four different spray materials used were: lime-sulphur, soluble sulphur, copper sulphate, and Bordeaux. Three applications were made each year as follows: A dormant spray was applied in April and two summer sprays about the middle of May and June respectively. The Bordeaux controlled the disease fairly well in 1915, but not in 1914. Copper sulphate almost entirely failed to control the disease and the foliage was severely injured. Soluble sulphur checked the disease somewhat but failed to give a satisfactory control. The lime-sulphur gave a satisfactory control during both years and without foliage injury. The dormant application of lime-sulphur alone proved a satisfactory control in 1914, but failed in 1915.

In 1917 the experiments were continued on another field of Plum Farmer near Leslie. These canes had been picked four seasons and were badly infected with anthracnose. This work was performed to determine how many applications of lime-sulphur to give. As in the two preceding years the dormant application of commercial lime-sulphur was diluted to two gallons in forty and the summer applications to one gallon in forty.

Lime-sulphur Controls

The field was divided into six plots which were treated as follows: (1) the dormant application only, (2) the dormant and first summer applications, (3) the dormant and the two summer applications, (4) the two summer applications, (5) the first summer application, and (6) unsprayed. At the end of the season plots (1) and (5) were found to be somewhat more free from anthracnose than the unsprayed plot. Plots (2) and (4) were in a better condition than (1) and (5), and plot (3) which showed but little anthracnose was in a better condition than (2) and (4). The check plot was badly infected with the disease.

The recommendations from the Michigan station is (a) a dormant spray in the spring before growth starts of commercial lime-sulphur diluted to two gallons in fifty; (b) a summer spray when the new shoots are six to eight inches high of lime-sulphur diluted to one gallon in forty; and (c) the summer spray repeated about three or four weeks later.

In planting blackberries and raspberries in a new plantation great care should be used not to plant anthracnose with them. This can be partially avoided by cutting off and burning all the canes and planting only the underground portion. A better plan would be to carefully dip the canes and upper portion of the crowns in commercial lime-sulphur as diluted for the dormant spray.

45,000 pounds of granulated sugar went to the bee-keepers in nine New York counties. Owing to the unfavorable weather, the bees were going into the winter with an insufficient supply of honey. The New York State Grange and Prof. Rea of the New York College of Agriculture made appeal to the Sugar Equalization Board. Some of us envied the bees through the sugar famine.

An extraordinary demand for cider is shown in the sale of $1,000,000 worth of cider apples in the two New York counties of Dutchess and Ulster this fall.

Dye Old, Faded Dress Material

"Diamond Dyes" Make Shabby Apparel Stylish and New—So Easy Too.

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A Quest for the Ideal Strawberry

By Frank Moffit, Indiana

A SCORE of years ago I planted my first strawberries. The claims of the pedigree plant men looked good to me at that time, so I would have no other kind. Since then I have planted a good many pedigree plants, also a good many of the other kind.

My first planting consisted of Excelsior, Sample and Brandywine. All good varieties, but each of them seemed to have some fault. I decided, when making my next planting, to try a number of new kinds in the hope of finding a variety that was faultless. I will say that this quest has led to my making the acquaintance of a good many strange strawberry varieties, having tested, during that time, considerably more than one hundred regularly introduced varieties. Also have grown many new kinds from seeds, as well as tested out many seedlings found growing in the fields or by the wayside. Some of these I am still growing for profit but none of them quite reaches my ideal.

In selecting varieties from catalogue descriptions it might appear easy to find the ideal. In fact they would all appear to be a near approach to perfection, but when the ideal is sought for in the fruiting beds it seems there is no such variety. These catalogue descriptions doubtless were given when conditions were favorable and the variety was at its best, and were honestly made under such conditions.

No other crop seems to be influenced so much by weather conditions as does the strawberry, so all these varieties have been carried for at least three seasons, thus making it possible to observe each one at its best as well as its worst. Almost all kinds have produced fairly good crops when conditions were favorable, but it is the ones that can be depended on to give the best crops under unfavorable conditions that are here to stay.

Among the causes for which many kinds fail, I have found the fault of setting too much fruit to be one of the most common. Most of the popular standards are only moderate croppers, while the Clyde, Fendall and other heavy setters of fruit have failed. The best crops I have ever picked from the Haverland has been during seasons when late frosts killed a large part of the bloom. Kellog's Prize is another one that has the habit of loading down with so much fruit that the later pickings often run small in size.

Undesirable size or shape are reasons why some varieties have been discarded. Strawberries the size of apples do not make an attractive pack in the usual size strawberry box, while fruit the size of a cherry makes slow work for the pickers. Uniform shape is also demanded, and round, or round pointed kinds seem to hold best to the type; even then the larger fruits sometimes break into rough or coxcomb form.

Some varieties start out well but seem unable to keep up the pace they have set. Dunlap is a variety that looked mighty good when I first began to grow it but for the last few years here has failed to live up to its early promise. Chesapeake is another one which, on short acquaintance, appeared to be the long-sought ideal strawberry. Unfortunately it has shown itself to be rather a slow plant maker and the plants are quitters after bearing one crop.

On the other hand the Aroma has steadily grown in favor for a score of years until it is now the most popular late variety found in the middle west. The Aroma can hardly be classed as ideal in any respect but is good in every way. Good cropper, good quality, good looker, good shipper and good healthy plant; altogether making a well balanced combination that few varieties possess.

After these years of testing, I am convinced that the ideal strawberry has not yet been produced, and the nearest I am able to describe such a variety would be a composite with the plant of the Bubach, the combined flavor of the Brandywine and William Belt, the form, finish, firmness, size and perfect flower of the Chesapeake, and, shall I add, with the season of the Progressive.

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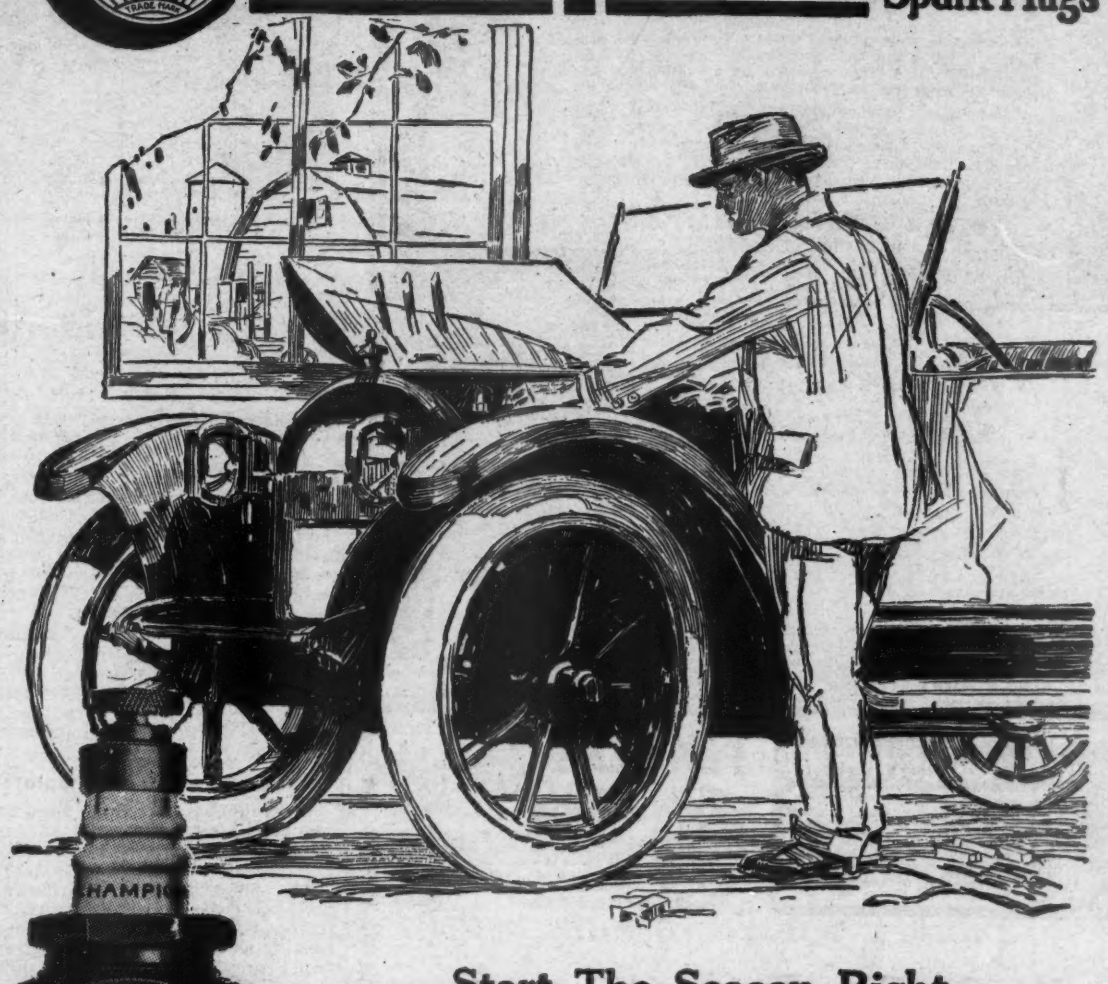

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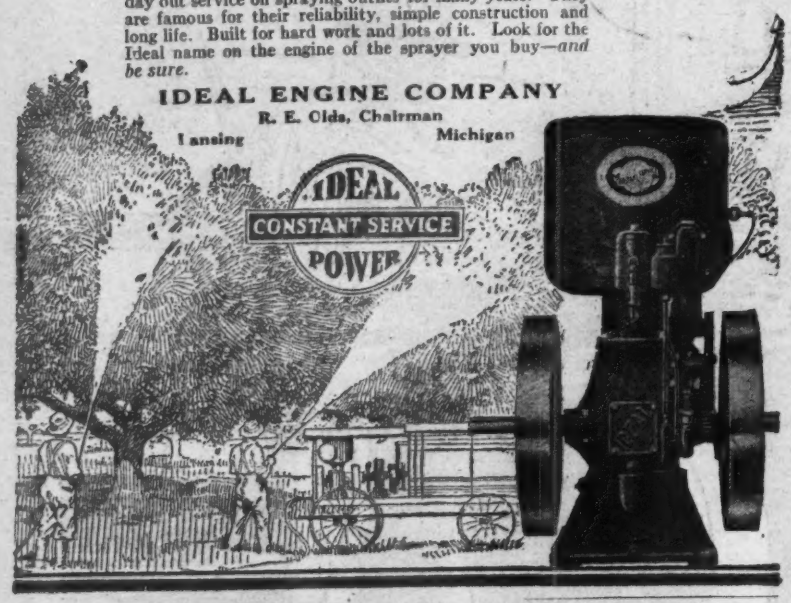

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Power Sprayers Have Been the Salvation of Many Peach Crops.

Lessons From Georgia

(*Continued from page 5*)

June 4th to July 19th, which was practically the end of the shipping season at Fort Valley, rain fell on twenty more days. There was rain on forty different days in south Georgia from May 1st to July 19, 1919. This, on top of the fact that the trees and fruit had been weakened by late cold weather, made brown rot conditions most excellent, and the fungus did not neglect any of its opportunities.

The mild winter of 1918-1919 allowed a heavy winter carry-through of curculio. The constant rains washed off the sprays as soon as they were applied, giving this pest every advantage, and as usual the little Turk did not overlook any bets.

Dusting and Liquid Sprays

Dusting has recently become of commercial importance in the peach sections of the state. This is really the first year that it has been extensively used, and naturally there has arisen quite a controversy over its effectiveness. There is a difference of opinion existing as to whether it should replace liquid spraying for the summer spraying or not.

This was an excellent season to test out any type of spray, and reliable reports show that dusting held its own. This is valuable information, as more acres can be handled with a duster than with a liquid spray. The general spraying of the orchards this past season was as good as usual, though there are a good many of the peach people who are still thinking that it could have been better. The necessity for spraying was more demonstrated this year than ever before.

Several points in distribution and marketing were brought out during 1919. There were really few large buyers in the field and these comparatively few men contracted and handled most of the crop. They were located mainly in two large markets, consequently these markets received a large percentage of the shipments and the distribution was not as good as in former years. The growers did not suffer seriously from this, as most of the peaches were contracted and sold f. o. b. Where it was shown that a grower was at fault in handling and packing the shipment, a great many of them shared the losses with the buyers.

A condition that further militated against the carrying of the fruit was the necessity of packing the cars five tiers high in order to conserve railroad equipment. Toward the end of the season quite a number of bushel baskets were shipped instead of crates, as it was found that the baskets, packed three tiers high, carried better than the crates packed five tiers. After July 12th an ice shortage developed and a number of cars of Elbertas were never re-iced after leaving the shipping point. To further confound confusion there was also a strike of longshoremen and freight handlers in New York City, which also caused great losses.

Shipped 6,900 Cars

Just after the middle of July the market weakened so rapidly, due to the above mentioned causes, that shipping from the Fort Valley section stopped on the eighteenth. What fruit remained on hand was disposed of to the canners. Approximately 6,900 cars were shipped from central Georgia south of Macon.

Previous to the opening of the season it was estimated that around forty per cent of the crop had been contracted at from $1.50 to $2.50 per crate, mostly around $2.00 to $2.25; this was f. o. b. Some carlot sales were made for as high as $3.75 per crate for very early fruit, but in practically every instance where large f. o. b. prices were paid, the buyers lost at the other end. Besides the Fort Valley movement there were around five hundred cars shipped from other sections and in the neighborhood of three hundred went out by express, this making the total 1919 crop of Georgia peaches approximately 7,700 carloads.

Now just what has been learned by the peach men of Georgia through the crop of 1919:

Lessons Learned in 1919

First, that there are too many early peaches; a good thing may be overdone. One of the largest growers says: "This crop has brought to our attention that there are only four varieties of peaches; namely, the Carman, Hiley, Georgia Belle and Elberta."

Second, it has been shown that indifferent and careless spraying and dusting must be done away with: spray chemicals must be applied thoroughly and every effort bent towards

(*Continued on page 50*)

Colored Men and Boys Picking Georgia's Far-Famed Peaches.

Like Trees in Triangles

By Harvey Lossee, New York

Sometime ago a correspondent asked what were the advantages of planting an orchard on the equilateral triangle plan, and the editor enumerated a number of them but failed to mention the greatest advantage of all. He also touched but lightly upon the next and most important one.

I have two good sized orchards which I set out, one by the square method and the other on triangles. Both orchards have been worked for a number of years by using most of the usual intercrops and working the trees alone. So I feel that I have had experience enough with each method to justify my expressing an opinion. I must confess that I am very partial to the triangular method. In the first place I admire the lines of this method very much—it pleases the eye more than the other. But this is the chief reason why I prefer it: if one of the base lines of the triangle runs North and South, or approximately so, the trees will get fully 35 per cent more sunlight, which will markedly increase the yield, quality and appearance of the fruit.

For example, if the trees are planted 40 feet apart everyway, the nearest tree in the sun's line—that is East and West, is about 70 feet; while on the square plan, the sunlight is blocked off East and West at just 40 feet.

The next great advantage, is not as the editor expressed it, you can get a good many more trees on the same piece of land, but you can get just as many trees on the same piece of land and have them a great deal farther apart. A man pointed out to me this fall 24 large, well developed Fall Pippin trees with plenty of space about them for sunshine and air and said: "Those 24 trees brought me $1,500 this year! If they had been cramped for lack of air and sunlight they assuredly would never have done it." Another grower with a large orchard just entering upon its prime, set his trees 35 feet apart, and already many of their branches intermingle.

I believe there is more profit in a thousand trees set 40 or more feet apart than in double that quantity at 30 or 35 feet. That is one reason why I do not believe in planting temporary trees except in very small orchards, though on account of a bad experience in having trees come untrue to name, I have been obliged to maintain a good many myself. But I find them a nuisance and an expense. While I would not think of planting trees in any other manner than the triangular style, yet the general farmer with a small orchard of one to a dozen acres, would, I believe, find the square method more satisfactory and besides, I have always found it quite a bit easier to lay out.

In the triangular method, I use two heavy galvanized wires with rings. I take one wire and mark out my base line, using sticks of exactly the same size. Half a lath will do, if they are all stuck in the ground in exactly the same way. Use the greatest care to have this line absolutely true. Then a ring of one wire is slipped over one stake, and the other over the next one. Then a stake is slipped through the rings on the other end of the two rings and pulled taut. This gives the first position in the second line. By this method, although my orchard is fully half a mile long, I was enabled to get perfect alignment in every direction. Do not use copper wire. I did at first, and when I reached the end of my orchard found myself 6 or 8 feet out of line, and it took me over two weeks to discover my error, as one wire had stretched about half an inch.

But whatever system of planting is used, remember it is of but little importance as compared with the necessity of selecting a good tree of good quality, and then giving it room in which to breathe.

For the encouragement of men who are prone to call themselves hard names when they have done something unusually foolish, the wise man has said "Those who never make mistakes never make anything else."

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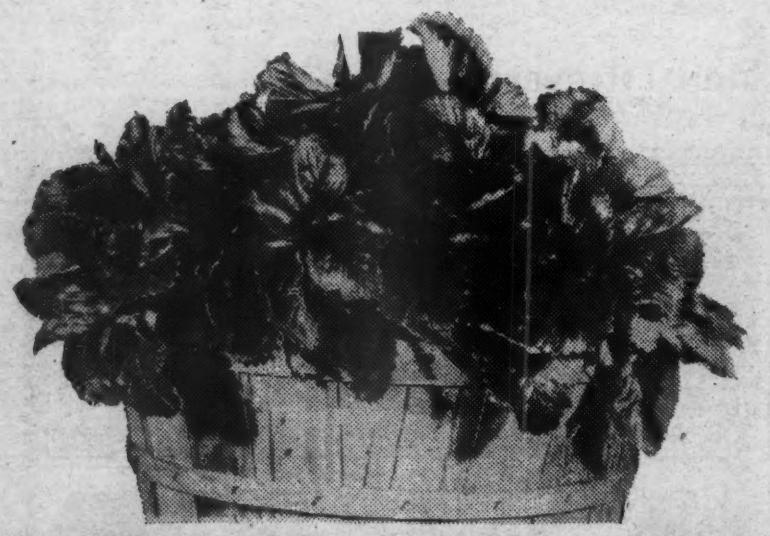

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Lessons from Georgia

(Continued from page 48)

improving their adhesive qualities so that fruit may be protected in the very worst and rainiest of seasons.

Third, the railroad equipment and facilities for handling and icing fruit must be improved.

Fourth, it has been learned that under poor transportation and icing conditions, the bushel basket, packed three tiers high in the car, carries better than the crate, packed five tiers.

Fifth, the value and efficiency of the Georgia Fruit Exchange has again been demonstrated, for it is the influence of this organization that brings f. o. b. buyers and contractors into the state. It is lamentable that these gentlemen should have suffered severe losses this year and it is hoped that these losses will not keep them out of coming peach deals, but should this turn out to be the case, the exchange can well handle future crops without them, as it has been done in the past. Had a condition similar to 1919 been encountered in former years, the growers would have lost money, become disheartened and thousands of trees would have been dug up: as it is now, organization has stabilized the industry and planting is still going forward.

Sixth, the growers are disappointed; they had their sights set high. Several successful crops had lead them to believe that they could not help but make a small fortune every year. Generally speaking, they have not lost money, but their profits have been cut about seventy-five per cent; yet even at that, the peaches have been more profitable than thirty cent cotton. Those of them who let speculative buying alone may not be able to get a new Packard this year, but they can get a Cadillac or Franklin, for they are not yet reduced to Fords. It is likely that they have learned that old, old lesson of not to count chickens before they are hatched.

Seventh, and finally, one of the largest buyers of peaches in the state says:—"We have learned that the peach section is not any longer the Fort Valley and Marshallville District, but trees are planted from the mountains on the Tennessee line to Florida. That it bids fair to be one of the largest industries Georgia has, and that the man who does not incorporate in his program the most effective methods of cultivating, spraying and handling will be the loser. The survival of the fittest will again be in evidence."

Fighting Frost in Oregon

(Continued from page 44)

block, they return to the starting point. As the breeze is from the south, the heat from the pots is wafted through the orchard and, as the men reach their post, they see that the green light has ceased to burn—the temperature is above the danger point.

But the cold continues and soon the lights again burn green. We watch them a few minutes, but it is too late to expect a rise in temperature as the sky is cloudless. Again we are off. This time we light every other pot in rows 4, 8, 12, etc., "breaking joints" with the other pots so that we now have every other pot in every other row burning. This usually suffices to raise the temperature again but, if it doesn't, we then go down the remaining unlighted rows and light every other pot. This would give us, with the exception of the first two rows and the outside edges, half the pots burning. That is to say one pot to every other tree in the orchard.

This can be carried out until a pot to the tree is burning and, if not sufficient, keep gradually increasing the number till there are two pots burning to every tree in the orchard or as many pots as were in position. When the sun rises, the men go through the orchard once more and place the covers on the pots upside down. This extinguishes the flames and shows to the filling crew exactly what pots need refilling.

(Continued on page 64)

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Order early as stock is very limited and sold in packets only. Packet of 100 seeds, 20 cents; 3 for 50 cents; 7 for $1.00.

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Strawberries for Local Markets

By W. H. Jenkins, New York

Profits are made by staying in the business. In the locality where the writer lives less strawberries were planted during the war, for patriotic reasons, and more land used for growing grain crops. The result was unprecedented prices for strawberries, last year—in many markets 25 cents per quart or more. The writer stayed in the berry business during the war, besides growing other crops, and planted about the same acreage each year. He was well rewarded for doing so, and thinks it is the best proposition in any farming business to plan to work on a unit of several years, and to figure the average profit for five or more years. This is about the only satisfactory way to figure profits in the fruit business, when frosts, drouths, or an oversupply may reduce profits.

The writer is close to some villages, where there is a good market for strawberries, and a large part of his crop from two acres is sold to people who come to his place for them, or order by telephone. The part of the crop that is not sold in this way is delivered by wagon or auto merchants in the villages, who have handled the berries every year.

The market problem is solved, when one gets a reputation for selling high class berries, those that are large and sweet, and taste like strawberries.

Manner of Setting Strawberry Plants

Success in the business depends on a right choice of varieties, a system of culture that produces large berries, and in advertising the quality of berries you are offering.

Some Good Varieties

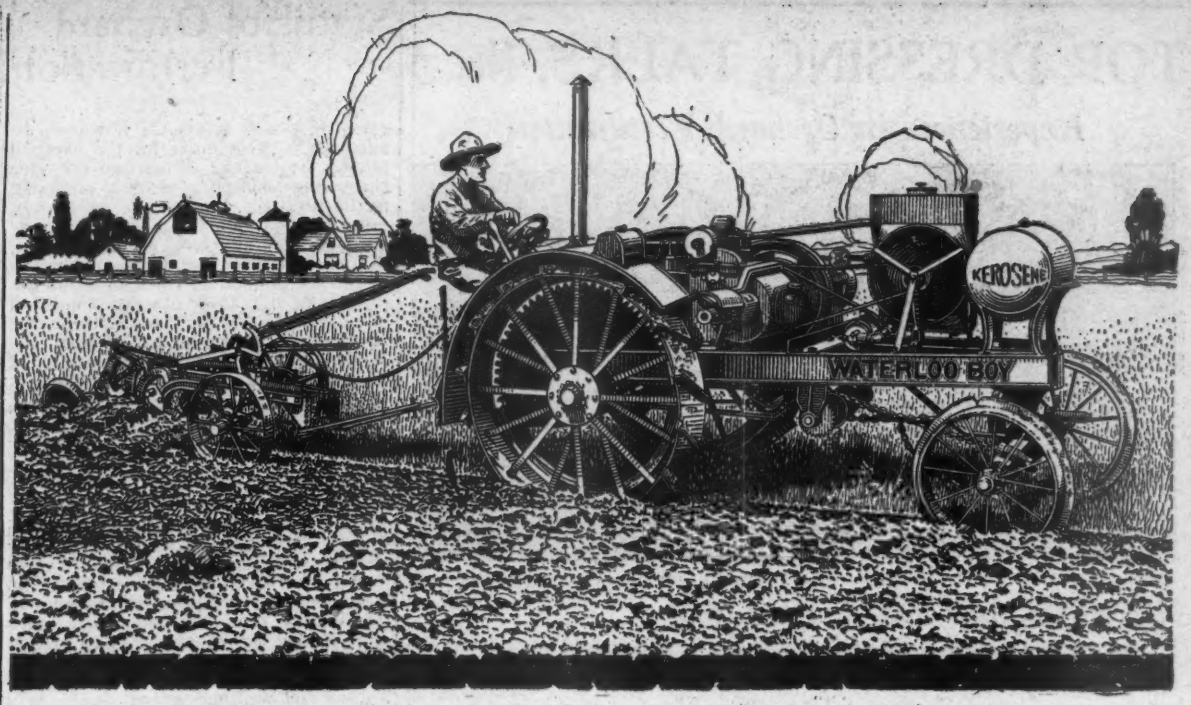
In the writer's case he prefers to grow the varieties that make a long tap root, and are therefore suited to hill culture, and for growing three or more years before renewing. Those that have the long tap roots, often produce better crops the second year than they do the first year of fruiting. Three varieties which he has grown for many years, and which will be retained, are the Marshall, Wm. Belt, and Brandywine. Another variety he thinks favorably of, is the Chesapeake. All these are staminate or bi-sexual and therefore do not strictly require the pistillate kinds near them to pollinize them, but some believe there is better pollinization by mixing the staminate varieties, as all varieties do not produce stamens to the same degree. These varieties mentioned seem well adapted to a medium clay loam soil in South Western N. Y.

Those who practice the wide row system, and fruit the plants only one or two years will get more quarts of small or medium sized berries by growing the pistillate varieties, with every third or fourth row of the staminates, to pollinize them. It is the belief of some growers, that there is less frost injury with the pistillate varieties.

Systems of Culture

Having selected the varieties best suited to our soil and system of culture, methods of culture are next to be considered. The strict hill system is far

(Continued on page 55)



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It gives you dependable service at small operating cost. Its twin-cylinder engine develops full 12 H. P. at the drawbar and 25 H. P. on the belt, using kerosene as a fuel. A patented manifold converts every drop of this low-priced fuel into power. Two gallons of kerosene per acre is the average amount used when plowing.

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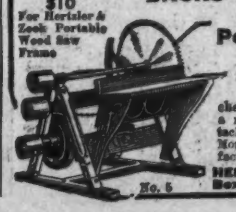

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The following results were obtained in a fertilizer test by Richard Reutter, Valley City, Ohio.

Variety: Northern Spy. Average yield per tree.

	Yield of Apples
No Fertilizer	11 bu.
Sulphate of Ammonia, 4 pounds per tree	17 Bu.
Gain	6 Bu.

ARCADIAN
Sulphate of Ammonia

is the best and most economical carrier of ammonia for the orchard. It is all soluble and quickly available, but does not leach from the soil. Write for sample and free bulletin "Fertilizing the Apple Orchard."

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Arcadian is the kiln-dried and screened grade, made fine and dry for top dressing purposes. Ammonia 25¼% guaranteed. Made in U. S. A. It is "*The Great American Ammoniate.*"

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TENNESSEE: *Nashville;* Federal Chemical Co. Tennessee Chemical Co.
VERMONT: *Rutland;* M. E. Wheeler Co.
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For information as to application, write

New York Baltimore **The Barrett Company** Atlanta Medina, O.

AGRICULTURAL DEPARTMENT

Status of Orchard Fertilization

(*Continued from page 8*)

gains, but not sufficient, however, to adequately compensate for the expense of the treatment. When we consider the young bearing trees on a similarly fertile soil the results are absolutely negative and fail to indicate any advantage from any fertilizer used.

Upon the other hand the application of nitrate of soda to trees of about the same age but in a starved condition gave most satisfactory results from the applications as is evidenced from the following data concerning length of annual growth.

No fertilizers	3.59 ins.
1 lb. nitrate of soda per tree	8.52 "
2 " " " " " "	9.71 "
3 " " " " " "	11.59 "
4 " " " " " "	14.22 "
6 " " " " " "	17.75 "

Throughout the experiment the nitrogen fed trees produced a healthy dark green foliage that in cases of severe rust or leaf spot infection seemed to be better able to withstand the ravages of the disease than the yellower, smaller and weaker leaves of the non-nitrogen fed plants.

The effect of fertilization upon fruitfulness followed the growth results in a general way, but indicated less rather than greater benefits. In time the nitrogen fed trees will doubtless produce more fruit than the others because in some cases they are slowly gaining in size and bearing capacity over the others. From the standpoint of fruit produced, nitrogen seemed to be the only effective element. Taken all together the West Virginia tests indicate that it is only the exceptionally weakened or starved orchard that requires artificial feeding under cultivated conditions.

New Hampshire

After ten years of a carefully conducted experiment in a cultivated Baldwin orchard, horticulturist Gourley reports that the fertilized plots have failed to respond to their treatment with suitable yields of fruit. In tree growth they did somewhat better although it was not until after the sixth year that a noticeable improvement in growth was secured. While the unfertilized cultivated plots have maintained themselves very well for the ten years they are now beginning to show the first signs of exhaustion, so that the time may come when some artificial feeding will be desirable. In contrast to this an unfertilized sod plot has not been producing sufficient crops to warrant the land remaining in orchard. In this same orchard applications of lime have had no apparent effects.

Massachusetts

Somewhat in contrast to the New Hampshire results are those secured in a test by the Massachusetts station last reported in 1914. The experiment was in a sod orchard and demonstrated striking benefits from the use of manure, phosphorous and potassium. In this connection it appeared that sulphate of potash was more effective than the muriate of potash.

Maine

The experiments in this state have been under way several years in a cultivated orchard. Up to the present time they are reported to have given absolutely no benefits from any of the applications. Even an excessively heavy nitrogen treatment has failed to produce the stimulation to wood growth generally expected from that material.

Ohio

In Ohio the experiment station has been conducting an interesting series of tests in the rehabilitation of neglected and starved orchards growing in sod. In this work they have achieved some remarkable results by the use of nitrate of soda. Applications at the rate of five pounds per tree have in some instances resulted in a 450 per cent increase in yield and three experiments have averaged a cash gain per acre of $125.75 per year for a period of five years. So successful have been these

(*Continued on page 58*)

RIPE TOMATOES

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No matter how backward the spring, it's easy with

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Big Catalog, free. All flower and vegetable seeds, bulbs, plants and new berries. We grow the finest Gladioli, Dahlias, Cannas, Irises, Peonies, Perennials, Shrubs, Vines, Ferns, Peas, Asters, Pansies, etc. All special prize strains, and many sterling novelties.

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THE ETTERSBURG STRAWBERRIES

Considerable interest among western berrymen and horticulturists has been aroused during the past several years by the Ettersburg strawberries of Humboldt County, California—a new race of berries that trace their ancestry to the wild beach berries of the Pacific Coast of the two Americas, the California wood strawberry and the Alpine strawberry. There are about 200 varieties of these unique berries having desirable commercial qualities which have prompted their creator, Albert F. Etter, to retain them out of some 10,000 seedlings fruited at the Ettersburg Experiment Place in northern California.

To what extent these hybrids will be adapted to cultivation in the interior has not been tested out thoroughly but at various points along the Pacific coast, and by some of the large seed firms of New York, the Ettersburg strawberries have been found to thrive under adverse conditions, pointing to a wide adaptation to varying soil and climatic conditions.

Mr. Etter began his experimental work with a few specimens of the Peruvian beach strawberry brought from Callao, Peru, more than a generation ago, for the purpose of discovering if a berry might not be created that would be especially adapted to the soil and climatic conditions of the redwood belt of northern California. There followed several years of experimental work with the wild strawberries of the Humboldt Coast, including the Cape Mendocino beach berry, the wood strawberry and a dozen of the regular named varieties of garden strawberries. The 200 varieties that have resulted from long years of experimental work cover a wide range of flavor, form and quality, the berries ranging all the way from very pale pink to red that extends to the center of the berry and that will stain the fingers, and from small acid fruit to sweet, perfectly formed berries. For the most part the hybrids have, however, a few common characteristics inherited from their wild ancestors which give them their claim on public attention.

Characteristics of Hybrids

The wild beach berries have a deep rooting system and this, in large measure, has been transferred to the Ettersburg hybrids. With roots that extend deep into the soil, the Ettersburg berries are able to thrive in comparatively arid soils. Actual experiment has shown that where there is too much water, or the soil is too rich, the Ettersburg hybrids tend to run to foliage and small fruit while rather poor soil will produce bountiful crops.

A characteristic of the Ettersburg berries is that they are of bush rather than vine formation, holding the fruit off the ground from one to eight inches, thus preventing decay. Generally speaking, the foliage is tough and leathery and serves as a protection alike from heat and cold. Because of this feature, these berries have been able to produce a crop in the southern California desert when the temperature registered 110 to 120 degrees and the soil was white with alkali. They are prolific producers, some of the varieties producing as high as 20 tons per acre. The fruit for the most part is solid and because of this characteristic is immune from damage from rain.

An interesting treatise on the Ettersburg hybrids has been prepared by Roy E. Clausen, instructor in genetics of the University of California, Berkeley, California, and sent out in pamphlet form by that institution. This authority predicts that these strawberries of wild parentage will be found highly successful under a variety of conditions, and attaches great significance to Mr. Etter's work in practical strawberry breeding. The extreme vigor of the plants, which may be in a measure attributable to the stimulating effects of crossing, has given the foundation for a hardy new stock to which the desirable qualities of the cultivated varieties have been added. While to most people there is little difference in strawberries, the peculiar characteristics of the Ettersburg berries immediately differentiates them from the garden varieties to the most casual observer, and we have in them a unique production which may prove of great value in the future.

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Long-Bell Creosoted Yellow Pine Fence Posts surround orchards and all farm enclosures with permanent protection. These posts are scientifically preserved with Creosote (Dead Oil of Coal Tar) which renders them impervious to decay. No other fence posts known will last as long as

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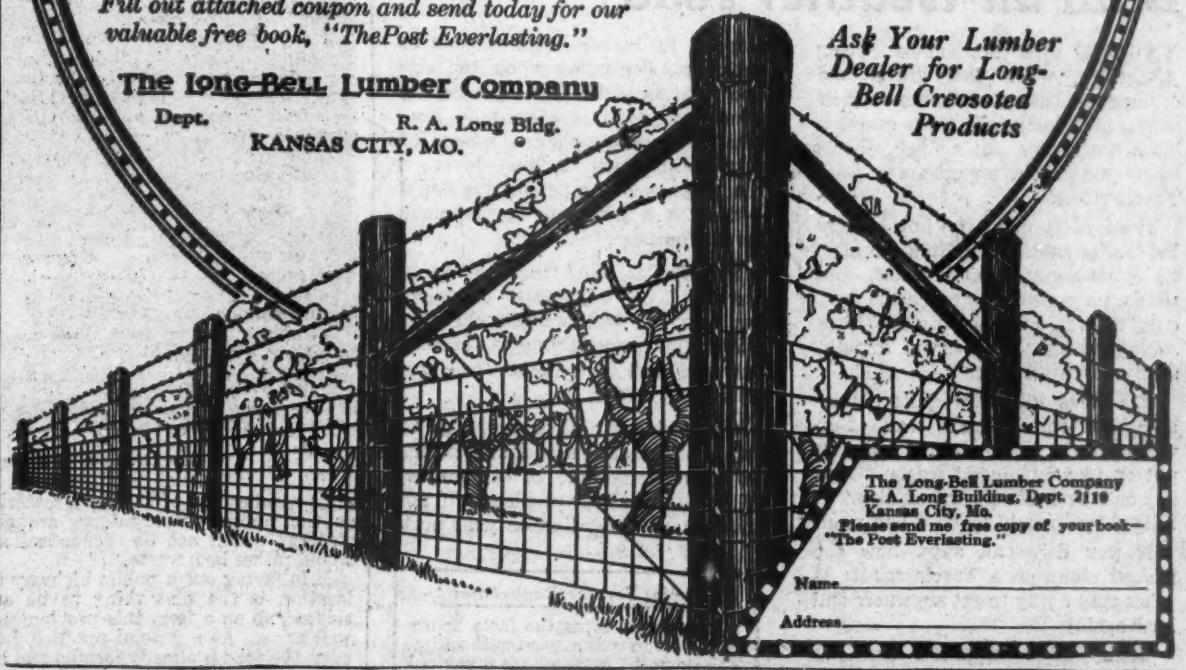

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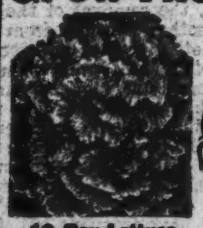

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grows strong and erect plants, producing great quantity, large handsome red fruits, very early, perfect beauty.

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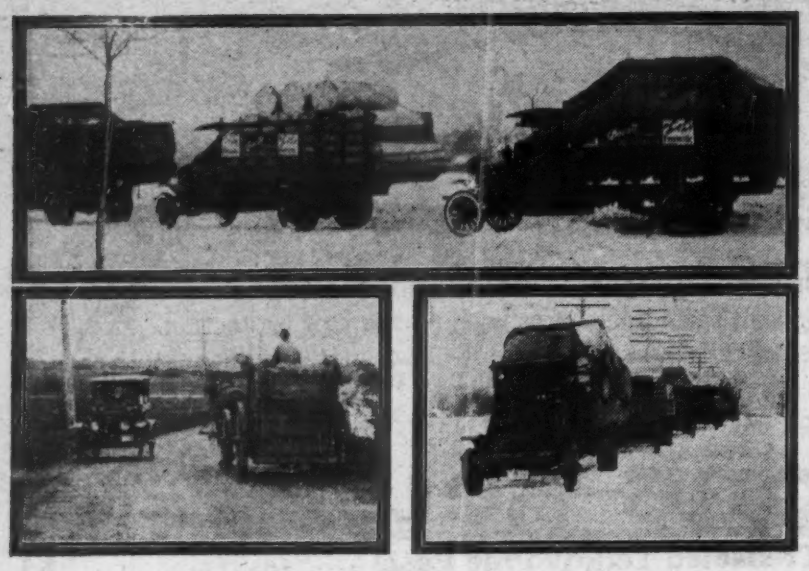

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Roads Within the Farm

By H. J. Kuelling

A WELL ordered farm should have well ordered roads and driveways to and around the buildings. In other words, private roads on the farm are as important to the interests they serve as the public roads over which the farmer's produce is marketed. A good road from the farmer's gate to his marketing place should not be depreciated by a poor road from the gate to the barn or packing house.

As stated above a poor private road on a farm is as great a handicap to efficient marketing as well as other farm operations as is a poor public highway. The fundamental principles involved in its construction are the same as those involved in the construction of a public highway. However, since this class of roads is called upon to bear a much smaller traffic, the ordinary methods of construction and of maintenance may be modified to meet the special conditions and to lower the cost. To attempt to build the farm roads, rather the roads within the farm, in the same manner and of the same materials as the public thoroughfares are constructed would not be economical and would rather be a waste.

If in laying out a public highway the location is the first thing to be considered, so on a farm this problem may well arise. As a general practice, however, the road is already located and any improvements will be made on the existing location. However, it will be worth the farmer's time to see if there is any improvement that may be made in the location before expending considerable sums for improvement. The roads and the paths around the farm are a part of the farm equipment. Hence they should be located where they will serve the best interest and at the same time avoid those places which will make expensive construction.

Material

The vast majority of the farm roads must necessarily be of earth. However, there is no reason why they cannot be graded up somewhat after the fashion of a public highway and maintained in that condition. Naturally the most fundamental thing is to have proper drainage. This involves two kinds of drainage; first, the removal of the surface water, whether it comes from rain or from some other source, and second, the removal of ground water, in many cases which comes too near the surface and causes a bad condition. The first, or surface drainage is accomplished by the common scheme of grading the road up so that the center is higher than the ditches which should be of sufficient size and grade to carry the water. These ditches should have frequent outlets so that the water may be gotten away from the drive. Subdrainage can be taken care of by tiles or by blind drains. That is, drains made of loose stone which has been placed in a trench and covered with straw and then dirt, or with burlap or something of that kind to keep the stone from filling. Most farmers who have the case where tile drainage is required also have tile problems in their land and know how tile drainage can be placed.

In considering the drainage of the road one might well consider also the drainage of the barnyard proper as this is really a part of the drive system of the farm. After the road has been graded up it is very much benefited by an occasional dragging with the ordinary split-log drag, or preferably what is commonly called a road plane. These road planes differ from a log-drag in that they have three or more points of bearing instead of two as in a drag. They thus not only smooth the road, but they even up its surface in that they tend to fill the low places which a drag will not do. The matter of when to drag a road has been discussed in these columns before and need not be repeated here.

In case new material is desired on the surface, there are several cheap surfacing that might be used. In case the farmer is blessed with any gravel, that is probably the cheapest thing that may be put on. As stated in a previous article in these columns, the finer the gravel the better it would probably be for the drive. This is true because it is then susceptible to better and easier maintenance than in case course gravel is used. It might also be well to remember that good results are obtained with some very sandy gravels, although it may take a little longer then to compact the road than where gravels with a small amount of clay are used. Another material that might be used if available is sand on clay or clay on sand. In case either method is used, the better the two are mixed, after placing, the more uniform and better will be the resulting surface of the road. The third material that is often available, especially near cities and even on some farms, is cinders. These make a very satisfactory farm drive.

In case it is desired to know how to construct these types, they have been covered by articles in the past issues of the AMERICAN FRUIT GROWER. Suffice to say that after the drainage is looked to and the good foundation has been obtained the materials may be placed directly on the ground either in the so-called trench method, where the material is set into a trench excavated in the road or by the so-called feather edge method where the material is placed on a flat subgrade and made thicker at the center than at the sides, where it feathers down to nothing. In case the trench method is used the earth shoulders should be graded up against each side to prevent the material from spreading. The material should, in either case, be spread in layers and given a small crown so that it will shed the water.

The width of road required is

(*Continued on page 60*)

One Life Lost—the Result of Driving Without Lights.

Strawberries for Local Markets

(Continued from page 51)

e most satisfactory, if one will hold himself up to all its requirements. Reasons why it is not recommended for general culture is that every one will not cultivate and hoe the plants at least once a week, and keep the runners all cut when they first start to grow, also because grubs may destroy part of the plants making large vacancies. To obtain a full crop, the plants should be set about 18x18 inches, which requires a large number of plants and much labor. The plants should be well mulched early in the winter for best results and also the land should be made very rich with a balanced fertilizer.

Very nearly as fine berries can be obtained with what has been called the hedge row system, which is practically the same as the hill system except the plants are set in rows about 20 inches apart, and 24 inches in the rows, and a runner plant bedded half way between. More than half the plants for setting are saved, and half the labor. The usual plan of the wide row system is to set the plants in rows four feet apart, and two feet in the rows, and allow plants to cover the ground except for a path between the rows from which to pick the berries.

The writer practices mostly the hill and the hedge-row systems. Sometimes the wide row plan is used when growing berries between trees and grape vines, and only two crops are taken from the plants before plowing them up. He grows his plants in a separate propagating bed, and transplants very early in the spring. A large poultry plant on his place furnishes the fertilizer. The plan is to amend the poultry manure with acid phosphate (and kanit when it can be obtained) by scattering them under the perches on the dropping boards. After the ground has been well prepared and is very mellow, it is marked one way with a homemade wooden marker, and a line stretched the opposite way by which the plants are set in check rows. Cross cultivation is then practiced, which reduces the labor of hand-hoeing. The plants must be kept clean as long as the weeds grow in order to make the hill system a success.

Marketing Made Easy

The varieties mentioned, grown by either the hill or hedge row system, should produce the finest berries possible to grow, and the marketing of them at highest prices paid for fancy berries is only a matter of letting people see them. People buy with their eyes, and a basket well-filled with very large berries, which have been left on the plants until well ripened sells itself when seen. By growing such berries year after year, a reputation is established and the problem is to furnish all the berries wanted. A large part of the crop has been sold at our place to people who come after them. The part of the crop not sold at home is delivered to dealers.

Women are the best berry pickers. The same ones have picked for the writer for many years, and can be left alone to pick the berries. New pickers have to be educated. At the beginning of the season, half the field is picked every day, and later if the weather is hot and the berries ripen rapidly, the whole field is picked every day. The berries are carefully inspected when they are brought to the packing house, and all berries are known to be sound and in good condition when packed in the crates. Those picked in the forenoon are marketed in the afternoon. Those picked late in the afternoon are kept in a cellar over night, and delivered to fill orders, early in the morning.

Second hand crates and new baskets are used. The pickers are given checks when they bring in berries. Those that remain until the berries are all picked get the highest price, which has been two cents per quart, and those which quit before the crop is picked, and ask for their pay, get one half a cent less per quart. Most of the berries have been grown as an intercrop in young orchards and vineyards, and have generally given a very good labor income, when the profit is figured on a unit of several acres.

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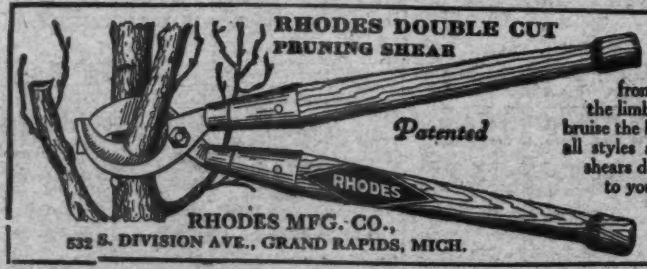

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Training and Pruning Trees

(*Continued from page 9*)

generally is definitely determined for the life of the tree by the treatment that is afforded its first five or six years in the orchard. After its form is once decided upon, the grower should regard the matter as settled, follow the procedure that is necessary in order to develop it and then turn his attention to the more important question of pruning — of modifying favorably through the use of the pruning shears and saw the vigor, productiveness, and regularity of bearing of his trees.

Distribution of Scaffold Limbs

More important than the question of the type of center (i. e. open center or leader type) a tree is to have is that of the method of forming its head. It is meant to include here the matter of height of head and number, arrangement and spacing of the scaffold limbs. In the first place it may be stated that low-headed trees, those headed between 1½ and 3½ feet from the ground, are to be preferred to those headed higher. The time was when high heads were in demand. They were thought to facilitate certain orchard operations and to be desirable in other ways; but their main advantage came from holding their fruit above the reach of stock pastured in the orchard; and with the passing of the day of pasturing stock in the commercial orchard this ceased to be an advantage. Early bearing, lessened danger from injuries of many kinds and greater economy in a number of orchard operations all argue convincingly for low-headed trees.

Many orchardists have made the mistake of starting their trees with too few scaffold limbs. When there are only two or three scaffold limbs they are almost certain to form bad crotches with the trunk or with each other, the result being a tree mechanically weak at that point and subject to splitting when heavily loaded or during heavy windstorms. Many orchards have been ruined from this easily-preventable cause. Their owners have said they "died out;" it was simply a case of "breaking down." Five, six, seven, or eight scaffold limbs are to be preferred to a smaller number.

One of the main advantages that the leader and modified leader types of tree possess over the open-centered tree is the fact that with those styles it is easier to secure the larger number of scaffold limbs. When there is a goodly number of scaffold limbs, each one carries a smaller load and has a better opportunity to form a good shoulder with the main trunk, thus reducing the trouble from splitting under strain.

That the scaffold limbs should be evenly distributed around the trunk is obvious. Yet many orchard trees show that this matter was not given serious enough consideration at the time of forming the head. A question, however, that is seldom dealt with satisfactorily, especially in case of open-centered trees, is that of securing a proper distance or spacing between scaffold limbs vertically on the trunk. In a comparatively large percentage of cases the trees are headed at some suitable height and then all the scaffold limbs, some three to seven in number, are permitted to arise right close to the top of the trunk, perhaps the lowest one not coming out more than six or eight inches from the topmost one. When this "bunching" or crowding of the scaffold limbs is allowed bad crotches develop as the trees become older, for the centers of these limbs always remain the same distance apart. This is another of the most common causes of tree "breaking down" and the orchard going to pieces in later years.

Within certain limits the farther apart the scaffold limbs are placed on the trunk the better. If the tree is headed at a medium height, say 3½ feet, and then the lowest of the scaffold limbs developed at a height of about two feet and the highest limb from the top of the trunk, a framework can be built that will very largely escape injury from splitting at the crotches. Of course in case of leader or modified leader trees only the first two or three scaffold limbs are allowed eventually to develop from that portion of the trunk below the point of heading at the time of setting. Other scaffold limbs are developed during successive years from points higher on the trunk. It takes a little more skill to develope a framework of this type; and the young tree may look a little odd (because different from the general run) for the first few years, but the resulting tree will be enough stronger to be well worth the effort.

The Amount and Kind of Pruning Required

Aside from training the young tree in a desired shape and so that it will have a good strong framework, the grower is interested in forcing it along as rapidly as practicable so that bearing size will be reached within a reasonable period of years. Pruning is one of the means of thus directing its energies into vegetative growth of the desired type. Both from the viewpoint of attaining the desired shape and framework and for the purpose of securing strength and stockiness in the scaffold limbs, the pruning at the end of the first year in the orchard should be heavy. No hard and fast rules can be given, but it may be stated that usually it is desirable to remove about three-fourths of the shoot growth, assuming that the tree has been doing reasonably well. This does not mean that three out of every four shoots are cut away. Perhaps only a quarter or a third will be removed; but those remaining will then be headed back to half, third or even a quarter of their length.

At the end of the second season in the orchard, pruning should again be heavy, but usually not so heavy as the preceding year. Succeeding pruning should gradually decrease in severity until at the age of six or seven years only a quarter or a fifth, or even less of the past season's shoot growth is removed. Furthermore, as the pruning decreases in amount it should gradually change in character, consisting more and more in a thinning out process and less in a heading back. The great tendency of the lighter pruning, together with the change from a little thinning and much heading to little heading and correspondingly more thinning is to encourage the formation of many strong vigorous fruit spurs. Thus the tree is equipped at a reasonably early age with the machinery for fruit production.

LOW-HEADED FRUIT TREES

How strange that fruit growers should require so many years of teaching in order to practice low-heading of their trees. You would naturally assume that a planter of orchards would recognize the importance of low-headed trees without any teaching or urging, but the argument for high-headed trees is, has been, that high-headed trees would be out of the way of cultivation by horse and cultivator or plow, whereas low-branched trees would be continually in the way of cultivation. Further than this, the average planter, particularly the farmer, desired to grow farm crops among his orchard trees and he found that low-branched trees interfered with the farm crops more and more the older they became, but these arguments are specious as seen at the present day by the progressive fruit grower who permits his trees to branch out close to the ground, thus reducing the expense of picking and the inconvenience and danger and also reducing the difficulties of spraying which are so essential. The up-to-date fruit grower is willing to yield all of the space between the trees to the production of fruit and gives up the idea of growing wheat or other farm products among the trees, which is in most cases a serious drawback to their development.

As regards the cultivation of low-headed trees, they do not interfere with cultivation in the early years much more than high-headed trees. In later years, when the trees attain considerable size, the shade of the trees and the low-branching prevents the growth of weeds and grass underneath them and there are tools made that will reach in almost to the trunk of the tree without interfering with the branches, therefore there is no question at all about the desirability of low-headed fruit trees.

Electricity in the Orchard Home

By E. N. Cable

Electricity is the greatest labor saver of modern times. The installation of electrical equipment on farms is taking place very rapidly. Many farmers who do not yet have electric power on their farms, are thinking about installing it, but are in need of much special information. Write to us about it, and let our electrical experts assist you. Address, E. N. Cable, AMERICAN FRUIT GROWER, Chicago, Ill.

FACTS ABOUT ELECTRICAL INSTALLATIONS

SUPPOSE a farmer wants electricity for his home. He must get his current from a central power station, must utilize nearby water power to run an electric generator, or else put in one of the modern electric plants that are on the market today.

If he gets the current from a central station, the voltage will be determined for him. It will probably be 110-volt current, "stepped down" or reduced from a very high voltage by means of a transformer. Where a number of farmers in a community adjacent to a high tension line want electricity, they frequently can get it by building an extention to their properties, or paying for its erection, and buying their transformers. They have meters installed at their homes. These are read regularly by representatives of the lighting company and they pay for the current they use just as their brothers in the cities do.

Where the water power plant or one of the individual gas engine plants is employed there will be the question of voltage to be decided. A volt, let us remember, is the unit of electrical pressure. A high voltage current can be carried economically for long distances over a very small copper wire. A low voltage current, on the other hand, would require a very large wire for any great distance, making it very expensive to carry low-voltage current far away from the source of supply.

When Water Supply is Scant

If a water power plant can be operated within a quarter of a mile of the farm buildings, with an abundant supply of water, it would be proper to use 110-volt current and run the plant right along, or at least when electricity is needed. If the water supply is scant, however, it would be necessary, probably, to store it until there was sufficient to run the generator and charge storage batteries. Here it would be better to use a 30 or 32-volt plant. For storage battery cells are of approximately two volts each and the fifteen or sixteen cells in a low voltage bettery would cost less than one-third of the price of a 110-volt battery, which would have fifty-five or fifty-six cells.

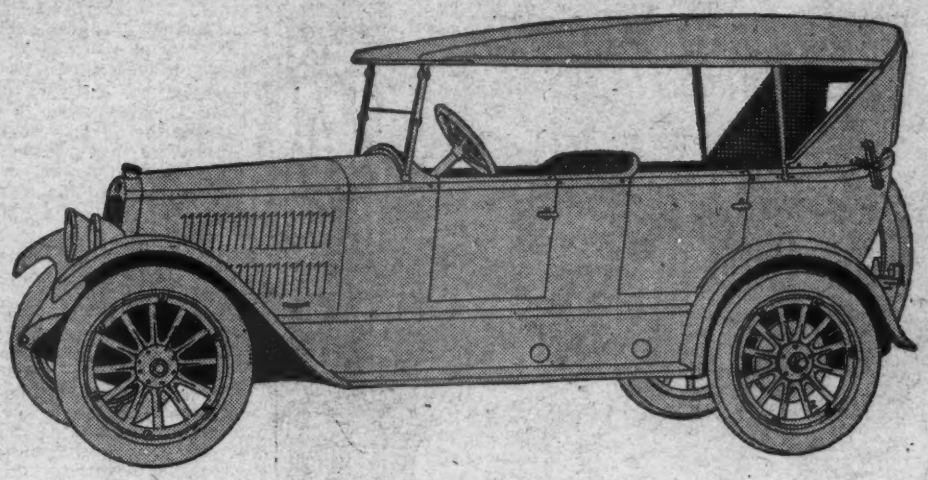
It is evident, then, that where the water supply is scanty and a long distance from the buildings, it will be better to put in one of the small electric plants that can be installed right at the house or barn. If the plant has an air-cooled engine as its source of power, it can be placed in any out-building without regard for freezing temperatures. If the engine is water-cooled, of course the plant should be placed in a cellar or other frost-proof place.

One general rule should be observed. The plant should be placed nearest the building where most current will be consumed. For instance, suppose there will be used at the house, at one time and another, twenty lights of 25 watts each, a flat iron using 500 watts, a washing machine using 225 watts, a vacuum sweeper using 200 watts, and an electric fan using 50 watts, while at the barn there are ten lights, each 20 watts, and a motor using, say, 225 watts, that is employed for light grinding jobs, running the horse clippers, the fanning mill and so on. It is evident that the greater load in this case is at the house and the plant should be installed as near as possible to that building, for the most economical installation.

Use Right Size of Wire

The amount of current that may be consumed is a factor in determining the size of wire that will run from the plant to the various points to be served. Here

(Continued on page 59)



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THE high attainment in mechanical excellence offered by the Victory Model of last season has enabled Mitchell experts and Mitchell resources to be devoted to the final development of new designs.

The style, unusual roominess and comfort have been many months in the making. They represent the best work of master designers. They forecast the coming style tendency and the newest ideas in finishing.

See these new standards in automobile art. See how clever designing has done away with unsightly vertical lines.

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Note the excellence of workmanship and materials. Note the completeness of every detail.

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Riding comfort has ever been a Mitchell feature. That comes from the cantilever rear springs. Ease is certain.

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3-Passenger Roadster
5-Passenger Sedan
4-Passenger Coupe

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All the choicest varieties grown in our own upland Nurseries, the largest in New York State, and offered to you at wholesale—For 36 years we have been building up our big Nursery business by delivering only the best quality stock, grown, dug and shipped under our personal supervision.

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Since there was a small planting of fruit tree seedlings during the war, there is now an alarming tree shortage throughout the U. S., only half enough to go around. If you don't want to be disappointed this spring, Order Early.

Send today for our big **Wholesale Catalogue.** It tells just the things the fruit grower and planter should know about our nursery stock, and much valuable information on planting and the care of fruit trees, shrubs and vines.

Visit our nurseries and let us show you our scientific business-like way of growing and selling trees—Let us show you over our 400 acres—Let us prove to you that we have the trees and plants you want. We will send you exactly what you order and charge you an absolutely fair price.

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MADE STRONGEST WHERE THE WEAR IS HARDEST

LADY WARE
A very fine mercerised stocking, fashioned with seam back. Black, white, gray, Cordovan.

Socks and Stockings to be glad about

WHEN you wear Durable-DURHAM Hosiery
—your feet are joyful
—your pocketbook is glad
—Mother is happy because there is so much less darning.

Every pair wears longer because made stronger at points of hardest wear.

Socks and stockings for city people—for country people—for women, children and men—for dress, for work, for play. Durable-DURHAM is the hosiery of the American family.

Ask your dealer for Durable-DURHAM. Ask to see the Lady Ware and the new Lady Durham style for women, the Cavalier for men and the new fine Polly Prim for children.

Look for the Durable-DURHAM trade mark ticket on every pair.

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DURHAM HOSIERY MILLS, Durham, N. C.
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STRAWBERRIES All Varieties Catalog Free
Rokely's famous Michigan plants. Only hardy well rooted stock. All varieties—Strawberry, Raspberry, Blackberry, Grapes, Currant, etc., **including the everbearing strawberry.** Write today sure for free catalog.
J. N. ROKELY R 3 BRIDGMAN, MICH.

WILD STRAWBERRIES
crossed with garden varieties
—RED in the CAN—
never collapsing or fading. Plants mailed one dollar dozen. Order from this advertisement.
Wm. M. Freeman, New Meadows, Idaho

Pay Nothing Until 60 Days

Now is the time you need a good, reliable sprayer for fruit trees, vines, shrubbery; for white-washing barns, chicken houses, hog sheds, etc. Here's a sprayer that will do the work thoroughly and quickly and pay for itself in increased profits. Prove it at our risk. Just send coupon—no money—and we will ship sprayer promptly. Use it 30 days free. If you then decide to keep it, make first small payment in 60 days, balance in 60-day payments, giving you nearly a

Full Year to Pay

Majestic All-Purpose Sprayer

This hand sprayer is just what you want if you haven't enough work to keep a power sprayer busy. Working parts made of brass. Specially constructed pump with high grade 4-ply rubber tubing. Automatic shut-off nozzle with non-clog spring cap. Light convenient. Easily taken apart for cleaning. Contents kept continually and thoroughly mixed. Sprays to the last drop.

FREE Book of Farm Necessities
Shows wonderful bargains in gas engines, cream separators, drills, cultivators, saw frames; circular saws, feed cookers, paints, roofing, etc. Write postal for free copy.

SEND coupon today for this sprayer and take nearly a year to pay if you like it. Just the coupon. No money.

—THE HARTMAN COMPANY—
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Send Sprayer No. 453AMA60. If satisfactory I will pay $2.00 in 60 days; balance in 60-day payments of $2.00 each until price of $6.95 is paid. Otherwise I will return it in 30 days and you pay transportation both ways.

Name.....
Address.....

Orchard Fertilization

(*Continued from page 52*)

experiments that the fruit industry of southern and southeastern Ohio has been entirely revolutionized and resurected from a decadent to a prosperous business. In these cases potassium when used gave no returns whatever and phosphorous benefited only the grass and helped thereby in producing a somewhat better sod mulch.

Oregon

The Oregon station also studied the rejuvenation of starved and devitalized trees through the use of nitrate of soda. They differed from the Ohio trees however in that they were under cultivation but the soils had become exhausted through constant tillage with no cover crops returned to the soil. Here again the starved trees responded promptly to the nitrogen treatment outyielding the check trees from 10 to 24 times, so marked was the effect. In these same orchards where nitrogen was so active both phosphorous and potassium proved to be entirely inactive and without value. The best results from the nitrate were secured when they were applied before the blossoms opened and growth started. After applying nitrate fertilizers for two years it was found that their influence carried over for two more years when no fertilizers were applied.

Various other stations have conducted similar fertilizer experiments but space will permit only a brief mention being made of their work. Missouri reports that the only element affecting growth and fruit bud formation is nitrogen. Illinois finds that nitrogen gives somewhat increased yields over other treatments. In Montana the tree starvation that follows constant clean cultivation is avoided by growing clover in the orchards and plowing only every third year. Indiana reports a ten year experiment in which commercial fertilizers were of no avail. A New Jersey experiment conducted a number of years ago, on the other hand gave minor gains from all three elements of fertility.

We have reviewed the work of a dozen or more of our agricultural experiment stations located in the leading apple growing states from the Atlantic to the Pacific and we have found a considerable disagreement in the results of their observations. Apparently where the orchards are in sod the greatest benefits were obtained but do all sod orchards require fertilizers, and if not, under what conditions may fertilizers be omitted?

When a tree is upon the verge of starvation an application of nitrate of soda is highly desirable but how starved must the tree become before the nitrogen tonic should be administered? Cultivated orchards have not given much encouragement to the manufacturer of commercial fertilizers but can they maintain themselves indefinitely without artificial feeding? In the next issue of the AMERICAN FRUIT GROWER the writer will attempt to answer some of these questions and present a reasonable program dealing with the problem of orchard nutrition.

FALLEN LEAVES

The poet has much to say about the season of the seared and fallen leaves. They are indeed beautiful, bearing numerous tints, and of interesting contour. The leaves of autumn are suggestive of the close of life, and yet they should not of necessity for the trees that have borne the leaves are still alive and full of vigor.

I love to tramp through the forests when the leaves have fallen and made a carpet for my feet. Nature makes use of the leaves in adding fertility to the land. The city resident as well as the farmer and villager will find forest leaves one of the best mulches for newly planted trees or shrubs, and as they decay they add to the fertility of the soil and growth of the plants. A peculiar faculty of the leaves is in protecting the ground from freezing. It seems difficult for the frost to force its way through a bed of leaves.

Examine the texture of a leaf and you will find in most instances that it is quite as tough or more so than paper.

How About August?

Just now seeds are only seeds—but they hold the measure of your crop. S. & H. seeds meet your expectations at the end of the season.

Our friends return each year. For 66 years farmers and gardeners have looked to us for good seeds, plants and trees. And they have received them.

Over 1200 acres of land are devoted here to careful trials and propagating—we prove before we sell.

Your catalog is ready. Will you write tonight?

The Storrs and Harrison Co.
Nurserymen and Seedsmen
Box 5-B Painesville, Ohio

A Wonderful Help to Fruit Growers

—beginners and experts say of "Inside Facts of Profitable Fruit Growing".

"Send me 12 copies for my foremen in charge of my various orchards" writes Senator H. M. Dunlap, of Illinois.

80 pages—44 pictures—10c postpaid.

"How to Beautify Your Home Grounds" tells how to be your own landscape gardener. Learn what and how to plant to obtain the finest effects. Worth ten times its cost. 10c postpaid.

"Better Fruit Trees"
A catalog of our hardy, Ozark-grown nursery stock. Sent postpaid, free.

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Neosho Nurseries Co.
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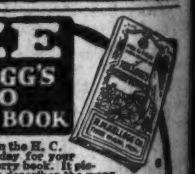

If you want to cut down the H. C. L. this year, write today for your copy of this big strawberry book. It pictures in colors and fully describes the many prize-winning varieties of KELLOGG'S FREEDOM STRAWBERRY PLANTS and

Kellogg Strawberry Gardens

This book tells how thousands of families are getting the benefit of Kellogg's Everbearing gardens the year 'round and making a big cash profit besides. This valuable book is FREE and postpaid. Write today to

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Three Rivers, Mich.

$12.95 Buys 140-Egg Champion Belle City Incubator

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CYCLE HATCHER CO.
165 Philo Bldg., Elmira, N. Y.

Electricity in the Home

(Continued from page 57)

we must know something of certain electrical units that must enter into the calculations to be made. One of these units is the ampere, the unit of the rate of flow of electric current. Another is the volt, mentioned above, the unit of electric pressure. A third is the watt, the unit of electric power. It is the product of volts multiplied by amperes. So, watts divided by volts give amperes. Thus, if in a 32-volt system we have a load of 500 watts per hour, 500 divided by 32 equals 15 plus ampere hours, indicating the rate of current consumption.

In figuring wire sizes, the "voltage drop" or loss in the voltage or electrical pressure secured at the end of the line must be taken into account. In a low voltage system a drop of 2 volts is allowable, while in a 110-volt as much as a 10-volt drop might occur. The formula for determining the sized wire to be used under any given set of conditions is as follows:

Distance in feet (one way) multiplied by 22, multiplied by No. of amperes, divided by voltage drop equals area in circular mills.

Applying this formula to the figures given above and supposing we are to deliver these 500 watts a distance of 200 feet, with a 2-volt drop we have:

$$\frac{200 \times 22 \times 15}{2} = 33000 \text{ circular mills}$$

Conculating the table below we find 33102 circular mils opposite No. 5 and so conclude that No. 5 wire should be used in this particular instance. With this formula and table one can work out the wire sizes for his farm home installation and by using the "feet per lb." column he can pretty well determine how many pounds of wire will be required.

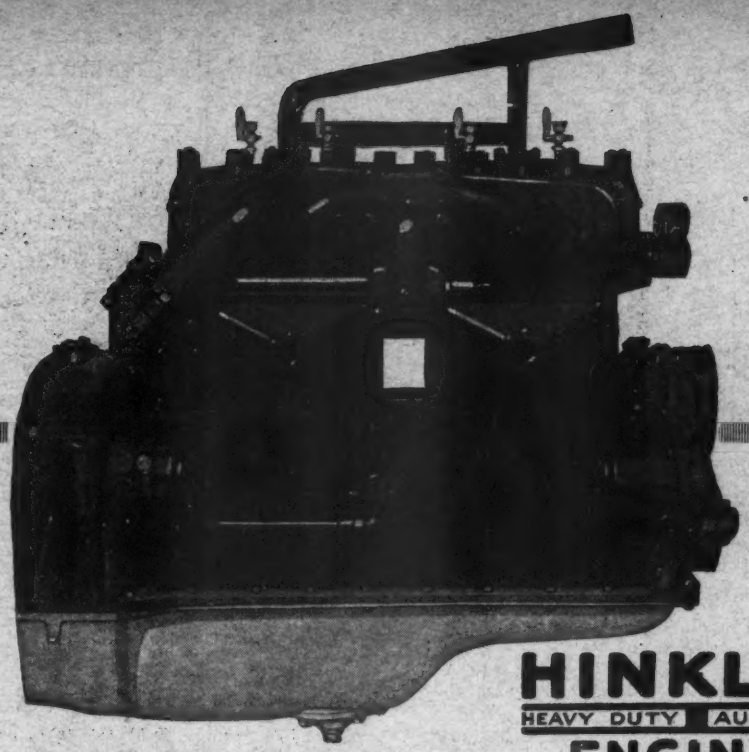
COPPER WIRE TABLE

B. & S. Gauge	Feet per Lb.	Area in Circular mills
0000	1.561	211,600
000	1.969	167,805
00	2.482	133,079
0	3.130	105,534
1	3.947	83,694
2	4.977	66,373
3	6.276	52,634
4	7.914	41,742
5	9.980	33,102
6	12.58	26,250
7	15.87	20,816
8	20.01	16,509
9	25.23	18,094
10	31.82	10,381
11	40.12	8,234.0
12	50.59	6,529.9
13	63.79	5,178.4
14	80.44	4,106.8
15	101.4	3,256.7
16	127.9	2,582.9
17	161.3	2,048.2
18	203.4	1,624.3

DO APPLE ORCHARDS REQUIRE MANURING?

No one can decide th's question without knowing something about the condition of the soil at present and its productiveness in past years. There are many farms throughout the country that are fertile enough to produce fine fruit and a good growth of trees without the addition of any fertility whatever. There are other farms that have been so far reduced in fertility that they could not be expected to bear heavy crops of large and superior fruit without the application of barn manure or commercial fertilizers. A good test is to notice whether the land will produce a good crop of corn, wheat or potatoes. If it is fertile enough to give good yields of ordinary farm crops, the assumption is that it is rich enough to make a profitable orchard. The New York state experiment station has been making experiments with the fertilization of orchards and the seeming answer to the question was that good farm lands rich enough to produce good corn are not greatly improved by the application of additional fertilizers.

But in the face of this I will call attention to the remark of one of the largest pear growers in the country. When I told him that some people thought that orchard trees did not require the application of stable manure or other fertilizers, his answer was, "O hell!"



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Hinkley Heavy Duty Automotive Engines, furnished heretofore to the United States Government alone, are today available for your purchase, and in a wide variety of sizes.

These Engines are Not sold at Retail.

You can buy them only as essential parts of a few of the Highest Quality Motor Trucks, the manfacturers of which are our Sole Customers.

To build, for these few Truck Manufacturers, Engines of a performance ability new to Mechanical Transport is the one purpose of this Organization.

A Hinkley-Engined Truck—alone or as a member of a fleet—will, we know, establish for you a record of Prompt and Faithful Service positively Exclusive.

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Are Standard Equipment in the Latest Types of Such Trucks as—

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U. S. — Mapleleaf (Canadian)
Columbia

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U. S. — Mapleleaf (Canadian)
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5 Tons
Oneida — Mapleleaf (Canadian)

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Save $15 to $500

Lowest priced High-Tension Ignition Engine ever sold at Factory-to-User Prices. High Tension is the only successful ignition for kerosene. All WITTE Engines are regularly equipped with H. T. battery, or Standard BOSCH Magneto on order. Write for latest prices. Quick delivery.
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SEND NO MONEY!

If you have useless stump land, I want to PROVE to you on your own stumps—*30 days before you pay me a penny*—that ONE MAN with my famous Kirstin Stump Puller can pull big, little, green, rotten, low-cut, tap-rooted stumps, hedges, trees or brush. I want to convince you that this is the easiest, quickest and cheapest way to pull stumps.

Write for Special Agent's Proposition!

Thousands of Kirstins Now in Use!

One Man Alone Handles Biggest Stumps!

I pulled one pine stump 3 ft. across top. My One-Man Kirstin pulls bigger stumps than I ever expected.
Mr. J. Bybbie, Calumet, Mich.

My Kirstin pulls stumps up to 3 ft. thick roots, 3 to 16 inches. Pulled tree 150 ft. high and 22 inches at base, in 15 minutes.
A. E. Jeffery, Goble, Oregon.

My Kirstin pulled stumps we thought it could not pull.
Mr. E. A. Buckley, New Savings, Minn.

After 30 days trial—if satisfied, keep puller. If not pleased, send it back at my expense. You *don't risk a penny.* Four easy ways to pay.

Single! Double! Triple Power!

Kirstin One-Man Stump Puller — Single, Double, Triple Power!

Weighs less—costs less—yet has greater *speed, strength, power* and *lasts longer!* Clears one acre from one anchor! Easily moved around field. A few *pounds* pull or push on handle exerts *tons* on stump—due to wonderful leverage principle. 5-year guarantee against breakage!

Get My Big New Book NOW!

Tells how one man pulls stubborn stumps in few minutes at low cost. Explains all about different speeds. Also patented quick "take up" for slack cable. Describes Kirstin one man Clutch Making Quick One Man Power Model and Kirstin Horse Power Model. Get the book and Special Agents' Offer. Shipment from nearest distributing point saves time and freight. Write today.

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A. J. KIRSTIN, Gen. Mgr., A. J. KIRSTIN CO.
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World's Largest Makers of Stump Pullers!

Fathers and Mothers

This Concerns You

Is there anything more poisonous to the young mind than trashy reading matter? Remember the boys and girls of today are the men and women of tomorrow.

Give Them a Helping Hand

Do your duty by supplying your children with good literature. This kind of reading has a great deal to do with the molding of the characters of the young folks, whose minds are just reaching out and grasping new ideas. We offer below a number of clubs with well-known puolications. Pick out your club and send your order today.

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McCall's Magazine	1 yr.	$1.00	
Today's Housewife	1 yr.	1.00	All
American Fruit Grower	1 yr.	1.00	For
			$2.00
		$3.00	

OFFER No. 12

Farm and Fireside	1 yr.	$ .35	
Woman's World	1 yr.	.50	All
American Fruit Grower	1 yr.	1.00	For
			$1.25
		$1.85	

OFFER No. 13

Gleanings in Bee Culture	1 yr.	$1.00	
American Poultry Advocate	1 yr.	.50	All
American Fruit Grower	1 yr.	1.00	For
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		$2.50	

OFFER No. 14

Woman's World	1 yr.	$ .50	
Hoard's Dairyman	1 yr.	1.00	All
American Fruit Grower	1 yr.	1.00	For
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Farm and Home	1 yr.	$ .25	
McCall's Magazine	1 yr.	1.00	All
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			$1.50
		$2.25	

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Poultry Keeper	1 yr.	$. 50	
World and Works	1 yr.	1.00	All
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			$1.85
		$2.50	

OFFER No. 17

McCall's Magazine	1 yr.	$1.00	Both
American Fruit Grower	1 yr.	1.00	For
			$1.50
		$2.00	

OFFER No. 18

Woman's World	1 yr.	$ .50	Both
American Fruit Grower	1 yr.	1.00	For
			$1.25
		$1.50	

OFFER No. 19

Pictorial Review	1 yr.	$2.00	Both
American Fruit Grower	1 yr.	1.00	For
			$2.50
		$3.00	

OFFER No. 20

The Dairy Farmer	1 yr.	$ .50	
Girl's Companion	1 yr.	.50	All
American Fruit Grower	1 yr.	1.00	For
			$1.60
		$2.00	

OFFER No. 21

Youth's Companion	1 yr.	$2.50	
People's Home Journal	1 yr.	1.00	All
American Fruit Grower	1 yr.	1.00	For
			$3.85
		$4.50	

OFFER No. 22

Ohio Farmer	1 yr.	$1.00	
People's Popular Monthly	1 yr.	.25	All
American Fruit Grower	1 yr.	1.00	For
			$1.50
		$2.25	

OFFER No. 23

Nat'l Stockman and Farmer	1 yr.	$1.00	
Woman's World	1 yr.	.50	All
American Fruit Grower	1 yr.	1.00	For
			$1.75
		$2.50	

OFFER No. 24

Michigan Farmer	1 yr.	$1.00	
Christian Herald	1 yr.	2.00	All
American Fruit Grower	1 yr.	1.00	For
			$2.85
		$4.00	

OFFER No. 25

Pennsylvania Farmer	1 yr.	$ .75	
Girl's Companion	1 yr.	.50	All
American Fruit Grower	1 yr.	1.00	For
			$1.75
		$2.25	

OFFER No. 26

Gleanings in Bee Culture	1 yr.	$1.00	Both
American Fruit Grower	1 yr.	1.00	For
			$1.75
		$2.00	

OFFER No. 27

Farm and Fireside	1 yr.	$ .35	Both
American Fruit Grower	1 yr.	1.00	For
			$1.15
		$1.35	

OFFER No. 28

Farm and Home	1 yr.	$ .25	Both
American Fruit Grower	1 yr.	1.00	For
			$1.15
		$1.25	

These prices are sure to advance later in the season; send your order Today.

DO IT NOW!

CLIP ME OUT—SAVE **MONEY**

American Fruit Grower, State-Lake Bldg., Chicago, Ill.

Gentlemen: Enclosed find $.....for Club No.....which send to the following address:

Name .....

Address .....

Post Office ..... *State* .....

A Successful Berry Association

(Continued from page 16)

was paid for picking. This was field run. The berries are taken to the packing shed by the picker in his or her 6-quart carrier. There they are emptied out and repacked, then placed in crates and made ready for shipment. All berries must be hauled in vehicles that are equipped with springs, or in motor cars or trucks, so as to subject them to no more rough treatment than is necessary.

This association has been a boon to the farming community all along the line here, as it has demonstrated and proved to fruit growers so forcefully the great importance of business co-operation, systematic methods, high quality goods; in other words, it has put "pep" into all of his farming work.

We consider that one of the greatest secrets of our success is the fact that the business management of the association has never been changed. W. Ed Roark, a son of the organizer of the association is and always has been the manager, and to whose honesty and business ability the association owes its success. All one has to do to avail himself of the benefits and privileges of the organization is to take membership by filing his application with the secretary and making a payment of fifty cents. This is formally acted upon at the first regular meeting of the association.

If any grower has plants or surplus crates to sell, or wants to hire help, the services of the association are available upon making his wants known. Refrigerator cars are used altogether for shipping the fruit. Eighteen miles north of Anderson, at Neosho, Mo., is a good ice plant where the cars are iced in the forenoon and brought down a little after noon all ready to be loaded and shipped out that night.

Aroma Is the Leader

This country is in the heart of the Ozarks. We have every sort of land from creek to high, rocky huckleberry hilltops, and it all raises good berries. The Aroma variety is grown exclusively. It has proved itself to possess more good qualities and fewer bad ones than any other sort. Newly cleared land is preferred for berries, not because it grows any better fruit than old land, but usually it is not foul with vegetation, hence easier to keep clean.

Young plants, that is plants of the current year's growth are preferred for planting. Old plants, however, are alright if care is taken in selecting them and none used except those which have renewed themselves by putting out new fibrous roots. An experienced grower can do this readily, but a beginner had best use the young plants for his success will depend altogether on the growth the plants make the first season. If a good stand is not secured the first summer it is never gotten, for resetting is very seldom successful.

The ground is prepared by being plowed deep with a turning plow in the fall. It is allowed to remain in that condition over winter, then as early as possible the next spring it is re-worked with shovel plows, harrowed and pulverized to put the surface in good condition to receive the plants. Planting is done as early as possible in the spring, usually in March. The plants are set in rows 3½ feet by 4 feet, establishing the rows the wide way. Cultivation at first is rather deep but as the plants begin to run, the cultivator is kept farther and farther away from them, and the plowing is less deep. The object is to encourage the plants to form matted rows about 18 or 20 inches wide by the time the growing season is over.

Some Big Money Makers

When the season has been favorable for plant growth these fields make some phenomenal returns. I have in mind one measured acre three miles from Anderson, belonging to William Whittaker, that yielded 303 crates this last year, and which produced a gross return of $1,818. Fifteen years ago that same piece of land would not have been considered worth its taxes, as it is right on the top of a high, rocky ridge. Another grower, T. E. Bell, from his 14-acre berry field picked 1,410 crates, that brought him $8,458.18; A. J. Taylor, from a one-acre trace, picked 219 crates that brought him $1,300. Another one-acre trace, which belonged to William Chapman produced 311 crates that sold for $1,866; while T. J. Hamby from four acres of berries, harvested 516 crates and sold them for $3,456.

To sum up the whole producing situation in this berry growing district the idea is to prepare the ground well, set good thrifty plants, get them out as early as possible in the spring, cultivate well and nature will do the rest. I would impress upon the mind of any who contemplate planting strawberries that they cannot be too particular in choosing help to set out the plants. Upon getting the plants set right the success of the future crop largely depends. Have none but the most trusty help and set each plant so that its crown is at or as near as possible on a level with the top or surface of the ground. Set with an iron dibble, such as gardeners use, and see that the soil is firm around the roots.

Roads Within the Farm

(Continued from page 54)

large. The traffic is light and seldom, if ever, do two loads meet.

An 8 inch to 10 inch surface is ample and in most cases 8 will answer. The grade, of course, upon which this surfacing is placed should be wider in order to provide for passing or for safety. Some farm equipment also requires a little wider range than others, and this should be provided for. In this connection, while it is not a matter of roads, the farmer might well remember to construct his gates of a width sufficient to permit the passage of his farm machinery.

Hard Surface Construction

Owners of some large farms, and what might be called estates, often seek a more satisfactory type of entrance than any of those named above. Some desire some bituminous material on the main entrance and the main drives and some even demand concrete or perhaps a brick surface. In the construction of bituminous material, whether it is in a surface treatment or in bituminous material used in the construction of the road itself, some care should be used in the purchase of the bitumens. If a drive is already constructed of stone or gravel or some such material, either a tar or an asphaltic oil may be used for surface treatment. In the case of most gravel roads the farmer should use a very light tar or a very light oil as neither of them make a satisfactory carpet on gravels owing to the clay contained in the gravels. These light bitumens will give very good results in taking care of the dust nuisance, but do not add much to the wearing qualities of the road. However, if a drive is made of clean stone or perhaps well cleaned and crushed gravel, a heavier tar or bitumen may be used in such a consistency that it will form a cushion on the surface and thus protect the road from wear as well as taking care of the dust nuisance.

In the use of the latter materials the compaction stone should be thoroughly cleaned of dust and the oil or tar applied with sprinkling cans from which the perforated nozzle has been removed and the spout flattened so that it has an opening or about one-quarter of an inch in width, thus making the material come out in a flat stream. If the material is of too heavy a consistency it should be heated so that it will flow very readily. Care should be used so that the material is applied uniformly to the extent of about one-half gallon per square yard.

In case it is desirable to build a concrete driveway, information should also be sought from some one who is well versed in this matter as a road of this type is long lived if properly built and costs a considerable sum. Hence it should have the best possible planning. The United States Government has a farmer's bulletin No. 461 on the use of concrete on the farm which may be had free from the United States Department of Agriculture at Washington, D. C.

In conclusion, it might be stated that with the ever increasing number of automobiles being used on the farm more attention will be given to the driveways leading to the public roads.

With Our Lawyer

By Newton Jenkins

The Legal Department is a feature of the service rendered by the AMERICAN FRUIT GROWER PROTECTIVE LEAGUE to its members. Legal inquiries only will receive the attention of this department, and all such inquiries will receive prompt consideration. It is not intended that this department shall supplant the local attorney. If the matter presented is of such nature as to call for the services of a local attorney, the subscriber will be so advised. Only such questions as are of general interest will be answered through these columns; all others will be answered direct by letter. Send in any questions about law that bother you. They will receive prompt and competent consideration. The AMERICAN FRUIT GROWER PROTECTIVE LEAGUE is yours to use. Join it now.

THE LAW OF WILLS

The right to make a will is not a right inherent in property. It is purely statutory and controlled by the legislature.

A will devising real property is governed by the law of the place where the land is situated. Thus, where the will was executed with a number of witnesses sufficient by the law of the state where testator was domiciled, but not sufficient by the law of the state where the land was situated, it is invalid.

A will does not operate and passes no right until the death of the testator. That is, a will is ambulatory. A man may draw up an instrument properly executed naming certain beneficiaries, yet those beneficiaries are not one whit better off and have no interest whatever in that property and the testator might change his mind the next day and make some other disposition of his property and the beneficiaries would have no right of action. A will speaks from the death of the testator and not before.

The testator must have intended to make a will. It is immaterial whether he calls it a will or a deed; the instrument will have operation according to its legal effect.

In order to make a will the testator must be of sound and disposing mind. One lacking this mental capacity is not capable of intending to make a will.

An instrument in the form of a will executed under undue influence or coercion is not valid, for the intention required by law is not present.

It need not be shown that the testator read or had the will read to him. His assent will be presumed.

Where a testator gave instructions for drawing his will, but died before it was finished, such a draft would not constitute his will.

If he signs in ignorance of the nature of the instrument, it is not his will.

The thing given and the person to whom it is given must be expressed in terms sufficiently certain that the court can determine what were his wishes.

A piece of paper bearing the words, "want wife's relatives to have all property" was not a valid will.

The death of the maker establishes for the first time the character of the instrument. It then ceases to be ambulatory and acquires a fixed status.

If the title passes before the death of the testator then the instrument is a deed and not a will.

Revocability is inherent in a will. The testator parts with nothing when he executes his will. He may thereafter sell the property, give it away, burn it up; or he may burn up the will or make a new one revoking all former wills, and again he may destroy or revoke them all and die intestate.

An instrument in the form of a deed, containing a clause that "in no event is this instrument to go into effect till my death" was held to be a will.

An endorsement on a promissory note, "If I am not living at the time this note is paid, I order the contents to be paid to X," was held to be a will.

One is not obliged to use any set form of words. He must express a wish as to the disposition of his property, but it must be more than a mere guide. A gift to one providing that she give to another a certain sum "if feel disposed to do so, but is not obligatory" was held to be a will, but a mere suggestion to be carried out at the discretion of some other person.

A conditional will may be valid if the condition is to be performed within the proper time. A farmer wrote, "I am going to town with my drill and am not feeling very good, and in case I should not get back," etc. While in town he became very ill, came home and died soon thereafter. It was held that the will was conditioned upon his not getting back and since he did get back the will was void.

Joint and mutual wills are valid. That is, wills that provide that the survivor is to take the property of the one dying first.

A will made in pursuance of a contract may be revoked, but the contract like any other contract may be enforced in an action for damages.

Capacity to Make a Will

Testator must be of sound and disposing mind and memory. The time at which the capacity must exist is that at which the will is executed. If the testator was qualified when the will was executed, but later became disqualified, the will is valid, but if he was disqualified, at the time the will was executed, though he later became qualified, the will is valid.

As to the age of testamentary capacity, statutes in different states vary. In some states infants may execute wills and in others they cannot. In some states it is twenty-one for males and eighteen for females. This is the rule in Illinois. One should consult the statutes of his own state to determine this point.

Married women can, under modern statutes, make wills as freely as men.

The testamentary capacity generally accepted is that the testator be "one who has a full and intelligent knowledge of the act he is engaged in, a full knowledge of the property he possesses, an intelligent perception and understanding of the disposition he desires to make of it, and of the persons and objects he desires shall be the recipients of his bounty."

An idiot, one "who both had no understanding from his nativity, and therefore is by law presumed never likely to attain any" cannot make a will.

Old age is not sufficient to avoid a will. Nor does the testator's mind have to be as strong as it once was.

The law does not require perfect sanity. If an insane delusion affects the understanding or memory of the testator as to the extent or distribution of his property or the recipients of his bounty the will is invalid. If, during a lucid interval, that is a period when the insane person is free from the delusion, such person ordinarly insane makes a will, then the will is valid.

Persons deaf, dumb and blind are competent as far as such disabilities are concerned, to make valid wills.

Mistake in the execution of a will is sometimes sufficient to avoid the will. A mistake as to the existence of a child is in some states sufficient to invalidate the will where no intention to exclude such child is expressed.

Fraud in the execution of a will brought about by false statements made to the testator intending thereby to deceive him and resulting in his deception is sufficient to violate the instrument.

Undue influence or duress brought to bear upon the testator either inducing him to make a will or affecting its provisions is sufficient to invalidate a will. By undue influence is meant any improper constraint or persuasion whereby the will of the testator is overpowered

(*Continued on page 66*)

You Want Protection

Don't invest your money in wild schemes just because you are invited to. Hundreds of thousands of dollars are annually mulcted out of the farmers and fruit growers of America because they invest first and investigate afterwards. Let the AMERICAN FRUIT GROWER PROTECTIVE LEAGUE investigate the standing of concerns which want your money.

BE A MEMBER AND SECURE—

Protection Against Frauds
Adjustment of Claims
Legal Advice

Enthusiasm Is Shown By Our Subscribers

Editor American Fruit Grower,
Chicago, Ill.

Dear Sir—Enclosed you will find $1.50 which is payment for a two year subscription, and I wish to be enrolled as a member of the League. I think we fruit growers have been in need of this for a number of years, and I think the American Fruit Grower should be given a great deal of encouragement and credit for promoting such a splendid move.

I am not a large grower, but I have some young trees that soon will be in bearing, and I know that the advice and help I will receive from this Department will be of great value to me, and I hope that every progressive grower will back this League and make it a success.

Very cordially yours,
Walter A. Sommers, Marlyand.

American Fruit Grower,
Chicago, Ill.

Gentlemen—Enclosed please find M. O. for $1.50 for two year subscription to the American Fruit Grower, also membership in the American Fruit Grower Protective League.

I take some forty odd fruit and farm papers, among them are some that cost five times as much as the American Fruit Grower and I must say that I get more *real value* out of the American Fruit Grower than any other paper or magazine that comes to my home.

Be sure and send December number, as I do not want to miss any copies.

Respectfully,
J. H. McDonald, South Carolina.

The American Fruit Grower,
Chicago, Ill.

Gentlemen—Just a little note with the reply of yours of July 5th, and also a money order for three years' subscription to the American Fruit Grower.

The farm that I now own hasn't the amount of fruit on it now that it will have in a year from now. I expect to set about seven acres of apples in the Spring of 1919, about an acre of raspberries and dewberries. I have got about three-fourths of an acre of strawberries just set last April, and all in fine shape. My apples are beauties, just finished the fourth summer spray and expect to spray once more this year. My trees are loaded with fine apples, have had to thin them quite heavily this year.

Last year I only had three different kind of apples at the Kosinsko County Fair, but took first prize on two of them and second on the other. I raised several Baldwins last year that were twelve inches around. This looks like a pretty big apple story, but I have got proof for it just the same.

But just the same I must take off my hat to the American Fruit Grower for my success. Three years ago my orchard was just like hundreds of others around here, full of scale and brush, and I never went into the orchard unless I wanted a wormy apple to eat. Then my wife got the American Fruit Grower in with some other papers, I picked it up one day and was just sketching through it and looking at the pictures, when finally I became interested in some of the articles in it, and asked my wife where she got the paper. She told me how she had gotten it and that it had been coming for about six months; so we hunted all of them up and I sure did drink of the valuable information.

That Winter I got all the bulletins that I was able to get from Washington and LaFayette, Ind., on fruit and by the time the robins came back they could fly through my trees, they did not have to stop and walk through.

In the Spring of 1917 I got me a spray outfit, never saw one before or never saw one work, but got one just the same to experiment with, and my experiment sure was a great success to me. I sold $184.42 of fruit from my orchard above expense of my pump, my time of picking, spraying, and hauling, and expect this year to get a larger profit.

It was quite amusing when I first began to work on my orchard to hear my neighbors talking about how I was going to kill my trees. One of my neighbors said if I ever sprayed my trees with that strong lime-sulphur it would take all the rough bark off my trees and then they would die; but they are not dead yet. The same man wants ten bushels of apples this year at $2.00 per bushel. Two years ago he could have bought a good spray outfit for the amount he will pay me this year for his apples, and if he had taken care of his trees he could have had apples to sell this year.

I believe every man or boy that reads the Amreican Fruit Grower and follows its advice will find fruit growing a pleasure as well as a big profit.

Yours very truly,
D. A. Davis, Indiana.

ALL ADVICE GIVEN FREE

Remember any information you want is given free to members of the AMERICAN FRUIT GROWER PROTECTIVE LEAGUE.

You never can tell when you will be obliged to seek advice from some legal advisor who will charge you from $1.00 to $50.00. You can get information or advice from our attorney free.

What You Get With Your Membership

2-Year Membership Certificate in
AMERICAN FRUIT GROWER PROTECTIVE LEAGUE
24 Monthly Issues of the AMERICAN FRUIT GROWER
1 Handsome League Membership Button
1 Enameled League Gate Sign
1 League Rubber Stamp and Pad

Send In Your Subscription and Become a Member

It is easy to become a member of the League. Send us $1.50, for which you will receive a two-year subscription to the AMERICAN FRUIT GROWER; a two-year membership in the AMERICAN FRUIT GROWER PROTECTIVE LEAGUE; a League Membership Button; a League Gate Sign; a League Rubber Stamp and Pad.

American Fruit Grower, Chicago

Enclosed find $1.50, in payment for a 2-year subscription to the **American Fruit Grower**, which entitles me to a 2-year Membership Certificate and full privileges of the **American Fruit Grower Protective League**, a League Membership Button, a League Gate Sign, and a League Rubber Stamp and Pad.

Signed.....

Address.....

Postoffice..... State.....

DO IT NOW

"Wasn't Getting An Egg—Now 10 a Day"

"I received your "More Eggs" Tonic and started giving it to my hens. I wasn't getting an egg, now I am getting 10 a day." So writes Mrs. Ernest Campbell, of Mineral, Va. Any poultry raiser can easily double his profits by doubling the egg production of his hens. A scientific tonic has been discovered that revotalizes the flock and makes hens work all the time. The tonic is called "More Eggs." Give your hens a few cents' worth of "More Eggs" and you will be amazed and delighted with results.

Now is the time to give "More Eggs" to your hens, while prices are high and profits big. Don't let your hens loaf; **make them lay.** "More Eggs" Tonic has **done** this for 400,000 chicken raisers all over the country. It will do the same for you.

$1.00 Package

Free

If you wish to try this great profit maker, simply write a postcard or letter to E. J. Reefer, the poultry expert, 3652 Reefer Bldg., Kansas City, Mo., and ask for his special free package $1.00 offer. Don't send any money. Mr. Reefer will send you two $1.00 packages of "More Eggs." You pay the postman upon delivery only $1.00, the price of just one package, the other package being free. The Million Dollar Merchants Bank of Kansas City, Mo., guarantees if you are not absolutely satisfied, your dollar will be returned on request. So there is no risk. Write today for this special free package offer.

Poultry Raisers Everywhere Tell Wonderful Results of "More Eggs"

"More Eggs" a Godsend

I received your "More Eggs" Tonic and found it was a great Godsend. I was only getting 12 eggs a day, and now I am getting 50 per day.
MYRTLE ICE, Boston, Ky

"More Eggs" Paid the Pastor

I can't express in words how much I have been benefited by "More Eggs." I have paid my debts, clothed the children in new dresses, and that is not all—I paid my pastor his dues. I sold 42½ dozen eggs last week, set 4 dozen, ate some, and had 1½ dozen left. MRS. LENA McBROON, Woodbury, Tenn.

1200 Eggs from 29 Hens

The "More Eggs" Tonic did wonders for me. I had 29 hens when I got the tonic and was getting five or six eggs a day. April 1st I had over 1200 eggs. I never saw the equal.
EDW. MEKKER, Pontiac, Mich.

160 Hens—1500 Eggs

I have fed two boxes of "More Eggs" to my hens and I think they have broken the egg record. I have 160 White Leghorns and in exactly 21 days I got 125 dozen eggs.
MRS. H. M. PATTON, Waverly, Mo.

1368 Eggs After 1 Package

Last fall I bought a box of your "More Eggs" Tonic and would like to have you know the result. From January 1st to July 1st my hens laid 1368 eggs. A. E. WHITE, Scranton, Pa.

Send No Money

Don't send any money; just fill in and mail coupon. You will be sent, immediately, two $1.00 packages of "MORE EGGS." Pay the postman upon delivery only $1.00, the extra package being **FREE.** Don't wait—take advantage of this free offer TODAY! Reap the **BIG** profits "MORE EGGS" will make for you. Have plenty of eggs to sell when the price is highest. Send today!

FREE **$1.00 Package**

E. J. Reefer, Poultry Expert
3652 Reefer Bldg., Kansas City, Mo.

Dear Mr. Reefer:—I accept your offer. Send me the two $1.00 packages of Reefer's "More Eggs" for which I agree to pay the postman $1.00 when he brings me the two packages. You agree to refund me $1.00 if **both** of these packages do not prove satisfactory in every way.

Name.....

Address.....

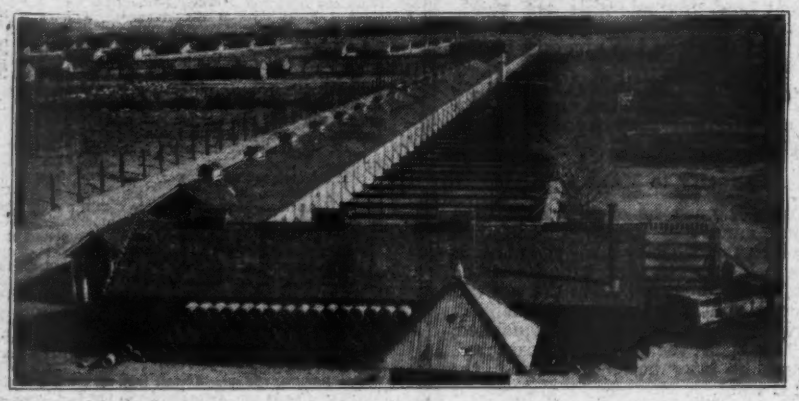
.....

Poultry for Profit

Subscribers are urged to write us in regard to their poultry problems. They will beanswered by experts, either through these columns, or direct by mail. Address, Campbell E. Cory, AMERICAN FRUIT GROWER, Chicago.

RAISING BABY CHICKS

THOUSANDS of beginners in poultry raising, as well as many experienced breeders, have found that the hardest problem after hatching or buying chicks is to make them live through the first ten days. Many hundreds of thousands of chicks are lost each season during this critical period because of careless and wrong feeding. Success with chicks depends entirely upon the person "behind the gun," for to be successful in brooding and feeding young chicks, one must not be careless as to details, haphazard in feeding, or negligent about sanitation.



A Brooder House in California One-Eighth of a Mile Long and Accommodating 20,000 Chicks.

The old saying, "A bird in the hand is worth two in the shell," is true enough as the purchase of day-old chicks has many advantages, and especially for the novice, over the old method buying eggs and hatching the chicks yourself. The chief advantage in buying chicks is that the buyer saves the cost of incubators, eggs, labor and the chances of an unsuccessful hatch. The price, too, of day old chicks these days is almost as low as many breeders charge for eggs.

Because of these many advantages many poultrymen, especially beginners, prefer the purchase of day-old chicks. The sale of chicks has placed the pleasure and profit derived from poultry raising within the reach of many to whom it would be out of the question if they had to buy the eggs and hatch the chicks themselves.

There are many numerous suggestions as to the best way of feeding, brooding and growing chicks, but by following the simple general directions given below even the beginner should have success.

There are many suggestions as to the best way of feeding, brooding and growing chicks, but by following the simple general directions given below even the beginner should have success.

Do not feed chicks for at least 48 hours. Many poultry keepers wait 56 or 72 hours.

Feeding chicks before they are 36 hours old often causes cholera which many mistake for white diarrhoea.

Dry feed is better than a wet mash during the first ten days.

There are now several buttermilk starting foods for chicks on the market that are very good.

Do not overfeed the chicks. It is best to feed a little oftener and not so much at one time. Feed five or six times a day.

Keep plenty of fresh water, fine grit and charcoal before the chicks. Always use luke warm water.

Test your brooder or hover and have it in good running condition before you place your chicks in it or under it.

Have temperature in brooder a little high rather than too low. Chicks will get away from excessive heat while too little results in crowding.

Give chicks ample run for exercise is most important in their growth. Chicks also should have plenty of sunshine and require fresh air, but must be protected from drafts.

Good Housing Essential

Chickens will not lay unless kept in a good physical condition, and to keep poultry for profit good housing is as essential as good feeding or anything else. Pullets and hens need care in cold weather if eggs are to be expected. Birds that sit on the roost all day, too miserable to face the cold in the snow-piled yard or the filth on the hen house floor, will never lay eggs.

Make the chickens comfortable so that on the coldest days they will get down and scratch. Overcrowded and poorly planned poultry buildings are often responsible for low egg yields. The house or poultry buildings must have three features. It must be light, it must be dry and it must be wind proof and free from drafts. A draft is air that comes through a crack or a knot hole and a draft has a telling effect upon chickens just the same as on all animal life. House the poultry properly for best results.

When you see bright red combs and wattles, active dispositions, heavy eaters, and a general habit of "up and at it," with perhaps some singing now and then, you may satisfy yourself that you have hens that will lay. Hens do not need artificial heat. In cold weather keep plenty of litter on the floor, make it deep, so that when the grain is scattered, the birds must work and scratch to get it. It is the work that makes them warm, and starts the blood to circulate, and the other organs to function properly. A light, dry, draft-proof building, deep litter, good feed and exercise brings the eggs.

Get More Eggs—Save Feed

A New 16-Page Bulletin Gives Free Information

Egg prices are high and going sky-high, higher than ever before. Those who know how and what to feed to get the most eggs will reap big profits. Improper feeding methods will result in fewer eggs, wasted feed-loss and disappointment. Prof. T. E. Quisenberry, Director-In-Chief of the great American Egg Laying Contest, and officially recognized as one of the world's greatest poultry authorities, has just completed a 16-page bulletin on "How to Get More Eggs and Save Feed." This bulletin also tells how he starts and feeds baby chicks to prevent white diarrhea and bowel trouble and how he feeds breeding stock to insure strong, fertile eggs, strong chicks, and to avoid dead chicks in shell at hatching time.

He will mail this bulletin to readers of the American Fruit Grower, who will write him without delay. Send no money. Over a thousand hens under Quisenberry's direction laid from 200 to 306 eggs each per year. He just finished making a profit of $6.15 per hen in nine months on commercial eggs from one large flock. Write him today for his free bulletin, addressing Care The American Poultry School, Department 481, Kansas City, Mo.—Adv.

Only $1.00 Down

Keep the New Edison Amberola—Edison's great phonograph with the diamond stylus—and your choice of records, for only $1.00. Pay balance at rate of only a few cents a day. Hear it in your own home before you decide. Only $1.00 down. **Write today** *for our New Edison Book* and pictures, *free.*

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Exceptionally Adapted for Fruit Production

Poultry manure as a Fertilizer, in its natural condition, is well known but by our scientific process of preparation it is much improved and will keep in good condition indefinitely, if kept dry. It is richer in ammonia and bone phosphate of lime than other manures and equal in potash. Analysis, 5% Ammo., 6% B. P. L., 1.50% Pot

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Samples and quotations on request.

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30 Days Trial
10 Yr. Guarantee

Think of it! You can now get this famous Iron Covered Incubator and California Redwood Brooder on 30 days trial, with a 10-year guarantee, freight paid east of the Rockies.

150 EGG INCUBATOR CHICK BROODER

Incubator is covered with galvanized iron, triple walls, copper tanks, nursery, egg tester. Set up ready to run. Brooder is roomy and well made. Order direct from this advertisement—money back if not satisfied or send for free catalog.

IRONCLAD INCUBATOR CO.

150 CHICK BROODER — Set 28 RACINE, WIS. — Made of Redwood serv'd with Galv. Iron

For Sick Chickens

Preventive and curative of colds, roup, canker, swelled head, sore head, chicken pox, limber neck, sour crop, cholera, bowel trouble, etc. Mrs. T. A. Morley of Galien, Mich., says: "Have used Germosone 17 yrs. for chickens and could not get along without it." Geo. F. Vickerman, Rockdale, N. Y., says: "Have used Germosone 12 years; the best for bowel troubles I ever found." Frank Sieha, Chicago, Ill., writes: "I have but 1 pigeon and no chickens in the 3 yrs. I have been using Germosone." C. O. Petrain, Moline, Ill., "I never had a sick chick all last season." Bernard Horsley, Kirksville, Mo., says: "Cured my puniest chicks this spring." Ralph Wurst, Erie, Pa., says: "Not a case of white diarrhoea in 3 yrs. I raise over a thousand a year." Good also for rabbits, birds, pet stock.

GERMOZONE is sold generally at drug and feed stores. Don't risk a substitute. We mail from Omaha postpaid in new 25c, 75c and $1.50 sizes. Poultry books free.

GEO. H. LEE CO., Dept. F-3, OMAHA, NEB.

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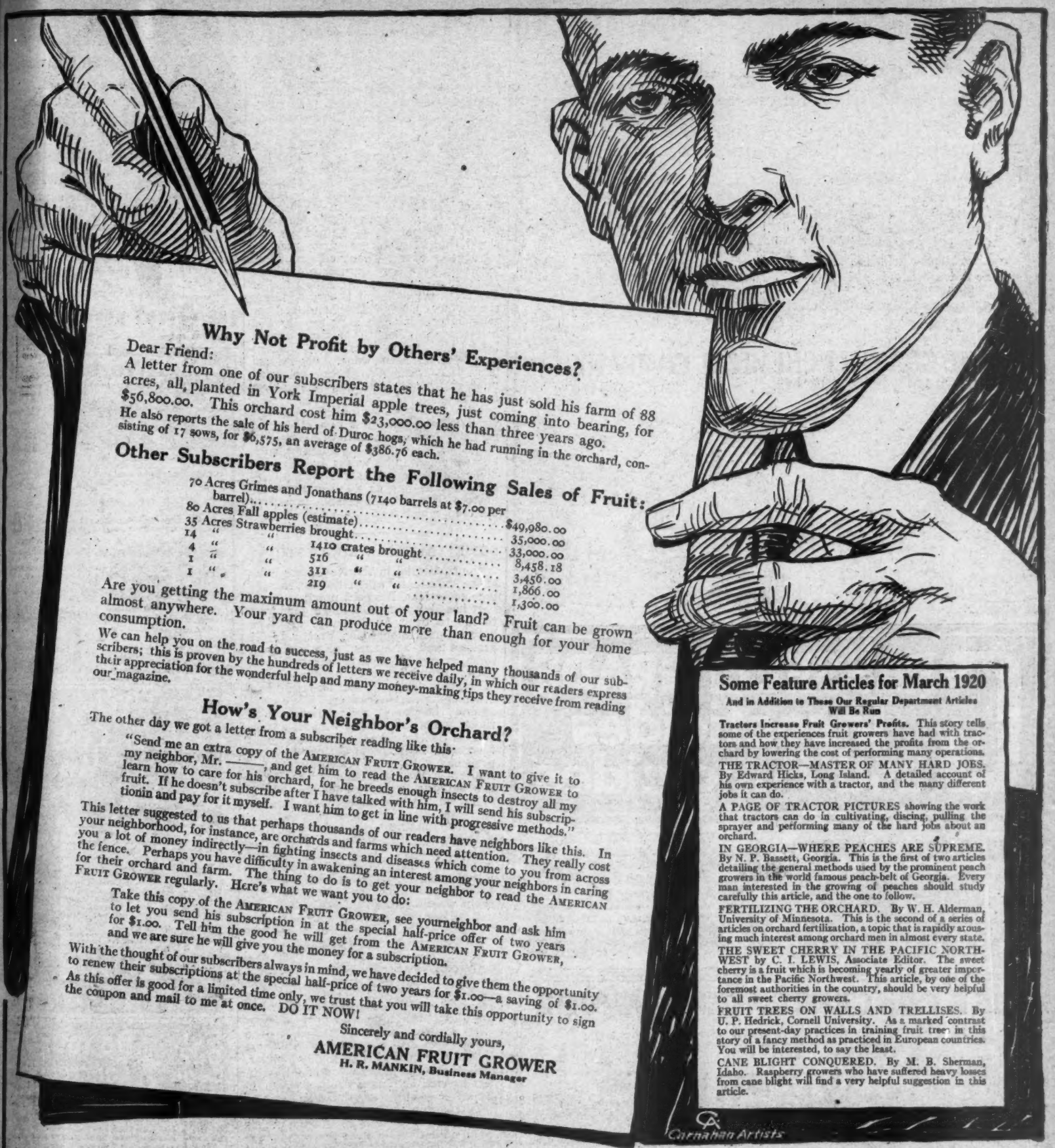
BE A DETECTIVE

GREAT DEMAND; Earn big pay; nice work; write Wagner, 186 East 79th St., New York. Dept. 691.



Why Not Profit by Others' Experiences?

Dear Friend:

A letter from one of our subscribers states that he has just sold his farm of 88 acres, all, planted in York Imperial apple trees, just coming into bearing, for $56,800.00. This orchard cost him $23,000.00 less than three years ago. He also reports the sale of his herd of Duroc hogs, which he had running in the orchard, consisting of 17 sows, for $6,575, an average of $386.76 each.

Other Subscribers Report the Following Sales of Fruit:

70 Acres Grimes and Jonathans (7140 barrels at $7.00 per barrel)				$49,980.00
80 Acres Fall apples (estimate)				35,000.00
35 Acres Strawberries brought				33,000.00
14 " "	1410 crates brought			8,458.18
4 " "	516 "	"		3,456.00
1 " "	311 "	"		1,866.00
1 " "	219 "	"		1,300.00

Are you getting the maximum amount out of your land? Fruit can be grown almost anywhere. Your yard can produce more than enough for your home consumption.

We can help you on the road to success, just as we have helped many thousands of our subscribers; this is proven by the hundreds of letters we receive daily, in which our readers express their appreciation for the wonderful help and many money-making tips they receive from reading our magazine.

How's Your Neighbor's Orchard?

The other day we got a letter from a subscriber reading like this:

"Send me an extra copy of the AMERICAN FRUIT GROWER. I want to give it to my neighbor, Mr. ——, and get him to read the AMERICAN FRUIT GROWER to learn how to care for his orchard, for he breeds enough insects to destroy all my fruit. If he doesn't subscribe after I have talked with him, I will send his subscription in and pay for it myself. I want him to get in line with progressive methods."

This letter suggested to us that perhaps thousands of our readers have neighbors like this. In your neighborhood, for instance, are orchards and farms which need attention. They really cost you a lot of money indirectly—in fighting insects and diseases which come to you from across the fence. Perhaps you have difficulty in awakening an interest among your neighbors in caring for their orchard and farm. The thing to do is to get your neighbor to read the AMERICAN FRUIT GROWER regularly. Here's what we want you to do:

Take this copy of the AMERICAN FRUIT GROWER, see yourneighbor and ask him to let you send his subscription in at the special half-price offer of two years for $1.00. Tell him the good he will get from the AMERICAN FRUIT GROWER, and we are sure he will give you the money for a subscription.

With the thought of our subscribers always in mind, we have decided to give them the opportunity to renew their subscriptions at the special half-price of two years for $1.00—a saving of $1.00. As this offer is good for a limited time only, we trust that you will take this opportunity to sign the coupon and mail to me at once. DO IT NOW!

Sincerely and cordially yours,

AMERICAN FRUIT GROWER
H. R. MANKIN, Business Manager

Some Feature Articles for March 1920

And in Addition to These Our Regular Department Articles Will Be Run

Tractors Increase Fruit Growers' Profits. This story tells some of the experiences fruit growers have had with tractors and how they have increased the profits from the orchard by lowering the cost of performing many operations.

THE TRACTOR—MASTER OF MANY HARD JOBS. By Edward Hicks, Long Island. A detailed account of his own experience with a tractor, and the many different jobs it can do.

A PAGE OF TRACTOR PICTURES showing the work that tractors can do in cultivating, discing, pulling the sprayer and performing many of the hard jobs about an orchard.

IN GEORGIA—WHERE PEACHES ARE SUPREME. By N. P. Bassett, Georgia. This is the first of two articles detailing the general methods used by the prominent peach growers in the world famous peach-belt of Georgia. Every man interested in the growing of peaches should study carefully this article, and the one to follow.

FERTILIZING THE ORCHARD. By W. H. Alderman, University of Minnesota. This is the second of a series of articles on orchard fertilization, a topic that is rapidly arousing much interest among orchard men in almost every state.

THE SWEET CHERRY IN THE PACIFIC NORTHWEST by C. I. LEWIS, Associate Editor. The sweet cherry is a fruit which is becoming yearly of greater importance in the Pacific Northwest. This article, by one of the foremost authorities in the country, should be very helpful to all sweet cherry growers.

FRUIT TREES ON WALLS AND TRELLISES. By U. P. Hedrick, Cornell University. As a marked contrast to our present-day practices in training fruit trees in this story of a fancy method as practiced in European countries. You will be interested, to say the least.

CANE BLIGHT CONQUERED. By M. B. Sherman, Idaho. Raspberry growers who have suffered heavy losses from cane blight will find a very helpful suggestion in this article.

Carnahan Artists

DO A FRIEND A GOOD TURN

Save Yourself and Friend a Dollar

It will take only a few minutes of your time and influence to show this copy of the AMERICAN FRUIT GROWER to a neighbor and to get him to send us his subscription on the blank inclosed in this issue. His confidence in your judgment will go farther than many letters from us or many visits from our agents.

One dollar inclosed with this blank will send the AMERICAN FRUIT GROWER to your friend for two years, or it will renew his or your own subscription for that length of time after its expiration. For each dollar you send, a two-year subscription will be given according to your direction. This is a special, limited offer, as our regular subscription price is one dollar per year.

It is our pride to know that you need feel no hesitation in recommending the AMERICAN FRUIT GROWER to your friends and in telling them that they will find in its pages many a dollar's worth of useful and interesting information.

GOOD-TURN COUPON

H. R. MANKIN, Business Manager — Feb.
AMERICAN FRUIT GROWER
State-Lake Bldg., Chicago.

Dear Sir:—Please enter my subscription for two years at the Special Half-Price rate of two years for $1.00. I also enclose $1.00 for a two-year subscription to be sent to my friend whose name and address I have written below.

My name is.....

Address.....

Post Office..... State.....

My friend's name is.....

Address.....

Post Office..... State.....

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Arsenate of Lead Paste and Powder
Calcium Arsenate
Lime Sulphur Solution
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118-Inch Wheel Base — 152-Inch Spring Suspension

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BUSH Address: C. M. Bush, President, Dept. B 148 MOTOR CO., Bush Temple, Chicago, Illinois

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OR CHOICE WATCH, CAMERA OR RIFLE

Everybody wants seeds. for selling only 40 packs assrtd. Vegetable Seeds at 10c per large pack. Easy to sell. EARN BIG MONEY or premiums. We trust you with seeds until sold. Address:

Send No Money

AMERICAN SEED COMPANY
Lancaster, Pa.
Box 190

USE CONCENTRATED MANURE

You can save money on your fertilizer bill and get the results you want on vegetables, fruit and berry crops with

WIZARD TRADE BRAND MARK CONCENTRATED MANURES

One ton gives you the equivalent of ten tons of ordinary stable manure.

Wizard Brand is dried and sterilized by direct heat process that destroys weed seed, fungus and disease germs—a safe, dependable natural fertilizer.

Insist on Wizard Brand with fifteen years of uniform quality and satisfactory service behind it. Your dealer can supply Wizard Brand or we will quote promptly with freight rates on a bag—ton—or carload.

THE PULVERIZED MANURE COMPANY
107 Union Stock Yards Chicago

Fighting Frost in Oregon

(*Continued from page 50*)

The advantages in the above system can be readily seen. In the first place, with the signal lamps it was easy for all to see just how long the temperature was below the danger point. As there could be no injury at 29 degrees or 30 degrees for two or three hours, the pots were not lighted at once but were watched. On the night in question the temperature rose twice, after the first drop below 30 degrees, and the total time, from the first time it reached 30 degrees to the time of starting to light the pots, was practically one hour.

Had the pots been lighted at the time the temperature first reached 30 degrees over a thousand gallons of oil would have been burned uselessly in the orchard in question. At a price of five cents per gallon it is easy to figure the saving. On the other hand, had the temperature dropped very rapidly and had the same length of time ensued before starting to light, some damage would have been done. The signal lamp is a warning that can be relied upon and saves itself many times over nearly every night one has to fire.

With the above system of firing, the writer was able to put two blocks, of fifty acres each, under fire within twenty minutes from the time of starting, with but six men. The writer has had no difficulty in successfully fighting temperatures as low as 26 degrees or 27 degrees with no appreciable injury to the crop, which was apples and pears.

SOME VALUABLE SUGGESTIONS

Your editorial in the November issue of the AMERICAN FRUIT GROWER, regarding suggestions, has been noted.

It has always seemed like a good idea to me to print an exchange of views between professional men, practical fruit growers and amateurs. For example, some grower is confronted with perplexing problems, such as the control of certain insect pests, diseases, and other puzzling questions. We will assume the grower communicates with the AMERICAN FRUIT GROWER for a solution of his troubles, you in turn could then refer his communication to the experiment station in his locality for a reply. In the next issue of the FRUIT GROWER both question and reply would appear. The communication of an amateur's troubles could sometimes be taken careof by the editor or somepractical fruit grower whom the editor could rely upon. These replies in a good many instances would provoke criticism from other reliable sources, which in turn could be printed providing the editor thought them worth while. In this way views and advice from various sources would be had instead of one, as on the page of "Orchard Problems." This page, at present, is ably handled and by the foregoing remark do not mean to reflect on the author. It is, of course, assumed each communication would be given a reply by mail as soon as practicable, in addition to that appearing in the AMERICAN FRUIT GROWER. I believe the *Rural New-Yorker* works along these lines and in this respect is highly popular.

If from time to time you could get in touch with successful fruit growers in different sections of the country and procure from them an account of their methods, not generalities, but full details of all operations, such as pruning, spraying or dusting, cultivation versus sod culture, cover crops and marketing of all important fruits. Added to this their experience with the different varieties of each kind, giving the good and bad points about them. It is certain the value of such information would be of inestimable value and highly interesting.

If experiment stations in various parts of the country would permit, it would be a mighty fine thing to reprint some of their latest and most important bulletins. Some could be covered in whole, while others could be continued in future issues. Unlimited material covering every phase of fruit growing is here available. This suggestion is made because, as a rule, nine persons out of a hundred will not avail themselves of these bulletins, whereas, if reprinted in the columns of a magazine the information is more certain to receive the attention of a greater number of people.

Dayton Airless

MAKERS of LIVE RUBBER (take the place of a TUBE)

Can't Puncture Can't Blow Out

No tube, no pumping, no delays. Dayton Airless look and ride like pneumatic tires but are absolutely trouble proof.

8,000 MILES GUARANTEED

They wear until they are worn clear through. Ten, twenty, thirty, and even forty thousand miles are the records of users.

BIG MONEY Business men write for exclusive county agency offer.

Made in 30x3, 30x3½ and 30x4 inch sizes only.

Write for Prices and Booklet.

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THE OLIVER OIL-GAS BURNER makes any cooking or heating stove a gas stove. Burns coal oil (kerosene). No coal or wood. Cooks and bakes better. Cheaper. Keeps your home warmer. You regulate flame. FITS ANY STOVE ANYWHERE. No fires to start, no ashes, no chopping, shoveling, poking and dragging of coal. Saves hours of work and loads of dirt. Simple. Safe. Easily put in or taken out. No damage to stove. Lasts a lifetime. Thousands of delighted users. In use eight years. Money-Back Guarantee. Free literature.

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Portable Fences for Orchards and Tractor Farms

Scientific Construction Ten Times Stronger

Carbo Steel Product Co.
2605 W. 111th St., Chicago

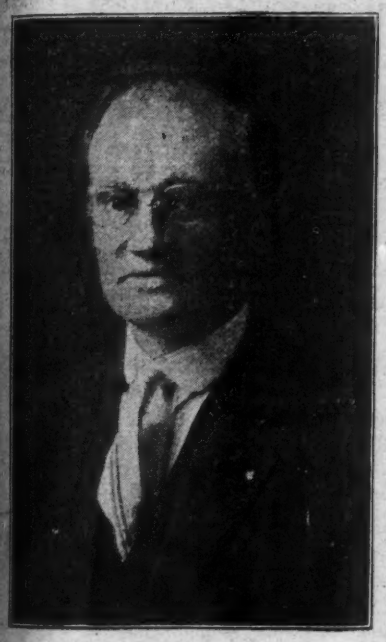
Iowa Fruit Meeting

By E. N. Hopkins, Iowa

THE IOWA State Horticultural Society held its fifty-fourth annual meeting at the State House, Des Moines, Ia. The program covered practically all phases of fruit growing, marketing, etc. The question of ornamenting our highways was well discussed and the park question was ably handled. The beauty of Iowa parks was well brought out and the need for an appropriation to maintain and conserve Iowa park interests was emphasized.

Brief reports were made of the two recent Horticultural Shows by Mr. Earl Ferris, of Hampton, Iowa. The horticulturists of the State and the Mid-West are encouraged over the progress made during the past two years.

Appreciation was forcefully expressed by the members for the financial aid given the Society two years ago by Mr. E. T. Meredith when he subscribed $2500 to underwrite the 1918 show.



R. S. Herrick.

At the annual meeting yesterday the board of officers and directors was changed somewhat. Mr. Wesley Green who has been secretary for the past twenty-one years and rendered splendid service to the Society and cause of horticulture retired in favor of Mr. R. S. Herrick of the Horticultural extension staff at Ames. Mr. Herrick has been secretary of the Iowa State Fruit Growers Association for the past two years and is probably in closer touch with fruit interests of Iowa and in a better position to act as secretary than any other one man. Special resolutions were drawn up expressing appreciation to Mr. Greene for the loyal service he has rendered and he was especially honored by being elected president emeritus for life.

Mr. S. A. Beach, Professor of Horticulture at Ames, was re-elected President for the third time, unanimously. Other officers and directors elected are as follows: Vice president, Mr. F. O. Harrington, Williamsburg, Iowa. Treasurer, Mr. C. N. Kinney, Des Moines, Iowa.

Boys' Fruit Clubs

The coming generation has been interested in the cause of horticulture during the past year. The extension office at Ames has organized what is known as the Apple Spraying Clubs. The first club was organized at Woodbine, Iowa. Five boys were selected for the club. The boys' fathers turned over 15 trees in the home orchard for these young fruit growers to care for during the past year. Under the direction of Mr. H. E. Nichols of Ames, the boys pruned and sprayed ten of these trees leaving the other five to bear as best they could in order to show the difference between cared for and uncared for trees. The results were what one might expect. The boys made a splendid showing on the ten cared for trees. They exhibited their fruit at the State Fair and at the Mid-West show.

Virginia Fruit Grower Reduces Hauling Cost

H. B. WAYLAND, fruit grower at Heards, Va., has made a saving of 40% on hauling costs since replacing his mule teams with a White Truck.

Roads in his section are so hilly and at times so deep with mud that four-mule teams are required. "It seemed doubtful to me whether any motor truck could operate successfully under the conditions. Certainly none but the very best could," writes Mr. Wayland.

Over a period of five months, his White 3-ton Truck covered 2,160 miles and showed a saving of 10 cents per ton-mile. The truck replaced two four-mule teams and proved capable of doing any work from fruit hauling to logging over narrow mountain trails.

White Trucks handle the hauling work of Fruit Growers with the same economy and satisfaction as they are doing for thousands of merchants and manufacturers.

Everywhere White Trucks are known for their high earning power. Hundreds of White Trucks, with mileage records of 100,000 to 300,000 miles, are still giving good service to their owners.

We will be glad to send you booklet containing owners' records of 100,000 miles and more made by White Trucks.

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BARKER WEEDER, MULCHER AND CULTIVATOR 3 Machines in 1
Kills the weeds and breaks the hardest crust into a level, porous, moisture-retaining mulch. Works as fast as you can walk. Cuts runners. Aerates the soil. "Best Weed Killer Ever Used." Works right up to plants. Guards protect leaves. Has easily attached shovels for deeper cultivation. Requires no skill. A boy can run it, and do more and better work than ten men with hoes. Inexpensive.

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you always shave with comfort.

It cools and soothes, no matter how tough the beard.

Nor is there any need to rub the lather in with the fingers. Don't do it—it only adds "mussiness" to what may be a genuine pleasure. (We've said this for years—men who use Colgate's are learning to give up the mussy "rubbing in.")

Lather with Colgate's—
Shave with Comfort.

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Either form you prefer —Stick, Powder or Cream

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Army Sweaters	$5.50
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History and illustrated book gives all details about most vigorous true to nature productive stock now grown. Book Free.

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BEES PAY. Easy, interesting work, with honey for home use. Send 50c today for 24-page Bee Primer and six months' subscription to the American Bee Journal. Catalogs of "Lewis Beeware" supplies sent free.

AMERICAN BEE JOURNAL, Box A-377, Hamilton, Ill.

Common Causes of Failure with Bees

(Continued from page 26)

placed on top. This should be watched from time to time and when the bees are seen to be storing freely in the second, a third can be added. Some skill is necessary to determine how fast to add sections to get all the possible crop and not give them too much and reach the close of the season with a lot of unfinished sections.

With extracted honey there is less trouble, since the honey is removed from the combs and it is less important that all be nicely filled. In a good season 100 pounds of honey per colony is not an uncommon yield. In one season Doctor Miller, of Illinois, secured an average of 266 finished sections per colony from his apiary of about 76 hives.

Lack of Foundation

In hundreds of cases the rearing of large numbers of drones consumes the productivity of the apiary. If allowed to have their own way the bees will often rear enormous numbers of drones.

Idle for Lack of Room in the Hive. Only 25 Pounds of Honey for the Season.

The drones do not gather honey and require large quantities of food and the attention of nurse bees in rearing them, when workers might as well have been reared instead. After they have been raised they still require food and occupy room in the hive.

There is quite a demand for drone traps on the part of ill-informed beekeepers. There is little to be gained by catching and killing them off, when a new crop is constantly coming on. It is an easy matter to reduce the number to reasonable limits, simply by hiving the bees on frames filled with full sheets of foundation, instead of upon empty frames or frames with narrow starters. Drones are reared in larger cells than worker bees. When building new combs the bees find it easier to build drone comb than worker comb, because the cells are larger and require less wax. It is not uncommon to find hives with from one-third to one-half drone comb.

The sheets of foundation are impressed with the size and shape of the worker cells, and the bees will build worker comb where foundation is given. There will always be some small patches of drone comb built in the corners, but some drones are to be expected and are not objectionable. Since the drone's sole use is that of perpetuation of the species, and since each queen bee lives for several years and is mated but once, but few drones are necessary to serve the needs of the apiary.

It is probably safe to say that if all the bees in America could be placed on full sheets of foundation instead of upon starters, that this one thing alone would probably increase the output of the honey from the farms from 20 to 50 per cent. The same thing applies to a less extent in the use of foundation in the supers. Too often but a small piece of starter is used when enough to fill the section should be put in.

When the honey is coming in rapidly there is often great loss because the bees have no comb built in which to store it. But few bees are sufficient to cover the small piece of starter, where dozens could work on the larger one. It takes time and honey to secrete wax to build the combs and every ounce of wax which the bees can be induced to use in the shape of foundation will return its cost from 10 to 50 times over in a good honeyflow.

Add to the above the very heavy losses from lack of suitable winter protection, and we have some idea of the reasons why the average return from the bees is so low. While there are a few men making from five to ten thousand dollars a year from bees, the average return makes such a poor showing as to indicate that it would be cheaper to buy the honey for home use, rather than to produce it. In such cases it is.

The Law of Wills

(Continued from paeg 61)

and he is prevented from exercising his unbiased judgment.

Force or threats used to overpower the will of the testator and persuade him to make a will renders the will invalid.

It is not necessary that the undue influence be exercised by the beneficiary under the will.

The law requires that a will be signed. One should remember that when the validity of his will is brought into question he is not present to explain away any irregularities appearing in the instrument and the task of establishing the instrument left behind him is sufficiently great without imposing additional difficulties.

The will should be signed at the end. If more than one sheet of paper is used the sheets should be securely attached and the paragraphs should follow in a connected way so as to prevent any sheets being removed. It is not well to leave large blank spaces for provisions might easily be subsequently written in by others.

It is necessary that the testator either sign the will before one or more witnesses or to acknowledge his signature before them. Some states require two witnesses, and still others require three. Illinois requires two witnesses. It is always best to have three witnesses because the will may affect interest in real estate in some state where three witnesses are required and the law of the place where the land is located applied. This might prove very embarrassing when it is too late to remedy the defect. The testator and the witnesses should sign their names legibly in ink.

The attestation by the witnesses should be on the same sheet of paper as that which contains the testator's own signature. The witnesses must sign in the presence of the testator.

J. B., Moccasin, Montana, writes:

Is a will made by a man who was not sane for several years prior to his death but which was made during such period of insanity binding?

It is not binding. A man who is not of sound and disposing mind is incapable of making a will.

C. L. N., Wilkesboro, North Carolina, writes:

Is it necessary for the witnesses actually to see the testator sign his name to his will? In the case I have in mind the witnesses were not present and did not see him sign but the document was taken to them later and they signed as witnesses without knowing that it was his will.

It is necessary for the witnesses to be present and see the testator sign his will and they must know that it is his will that he is signing, although they need not know the contents of the will.

J. R. P., Holland, Michigan, writes:

It is proposed that a railroad be constructed which will run through our farm lengthwise, destroying thereby a pretty canyon. Would the company not be obliged to consider owner's wishes regarding one or two routes across the farm.

The company will set forth the route which it desires to follow and present the same to the commissioners of appraisal. Those interested may present their objections before the commission and if they are deemed sufficient then the company will be obliged to select the other route.

Universal Bushel Shipping Packages

—offer many advantages to all fruit and vegetable growers and shippers. They afford a neater and more attractive pack. They positively protect fruit and produce from being crushed while in transit.

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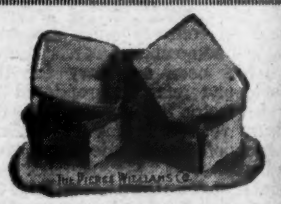

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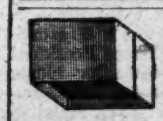

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The Orchard Home

A Section for Orchard Women and the Children

Edited by Mary Lee Adams

Children Love Fruit

WE KNOW that children love fruit and that it is good for them. We wish there were enough fruit for every boy and girl, city and country, to have plenty of it. We must raise much more fruit if this is to be accomplished. Living in the country, it is hard to realize how scarce fruit is in the city even in moderately well-to-do households. Read the following little story of a "buntch" of boys and one lone apple and, while you laugh, isn't there a hint of a lump in your throat to think of any honest-to-goodness boy being so apple-hungry and unable to satisfy his craving?

Lee Pape says the following in the Chicago Evening News:

Sid Hunts quiet little cuzzin Joe was setting on Sids frunt steps eating a appel after skool yestidday and I started to go past and then I had a ideer and stopped and sat down alongside of him, saying, Hello, Joe, wares Sid?

Sumware, I gues, sed Joe. And he kepp on eating the appel, and I sed, Save us the core, will you, Joe?

Maybe, sed Joe. And pritty soon Puds Simkins came up and sat down with us, saying, Hello, fellows, hello, Joe, give me next on the core after you, Joe? Will you, Joe?

I mite, sed Joe.

And he kepp on eating the appel, being about half way thruo, and Leroy Shooster came up and sat down, saying, Hello, everybody, hello, Joe, after you on the core, will you, Joe?

I dont know, sed Joe.

And he kepp on eating the appel, the core being almost in site, and Reddy Merfy came up and sat down, saying, Hello, buntch, hello, Joe, I aint saw you for a long time, how about saving me the core, Joe?

Ill see, sed Joe.

And he took about 3 more bites slow, with me and Puds and Leroy Shooster and Reddy Merfy all looking at him anxious, and then he bit off half of the core in one bite and the other half in the next bite, sayin, I cant give the core to everybody.

And he got up and went in the house, me saying, Gosh, G, tawk about your tite wads, and Puds saying, I wouldent of ate his old core anyway, it was all full of derty finger marks, and Leroy Shooster saying, Its a good thing he dident try to give it to me, Id of stuck it in his eye, and Reddy Merfy saying, if he ever dasts tries to get me to take one of his old appel cores Ill show him whose boss all rite. G, I wouldnt be such a stingy.

Stick to the Farm

WE READ lately with a rush of sympathy of the Wisconsin farmer who, having sold his farm, found himself at the end of a single summer so unhappy away from his accustomed surroundings, that he tried to repurchase it. Failing in this effort the poor, miserable creature hanged himself.

This was an extreme case, but we believe that the depression which led to the act is a very general accompaniment of the change from an active, interested life on one's own farm to a life (often quite idle) in the city. Statistics show that the days of the farmer who "retires" to the city are numbered. A few years see his finish as a broken-down old man. The only salvation for the uprooted farmer is to engage in some other form of occupation which, even if it does not fill his days with joy, at least saves him from "dry rot."

The farmer's wife fares far better than he under this change. Whether she really needs the rest more than he does, whether her household duties keep her sufficiently busy even in the city to insure a healthy state of mind and body, or whether social interests make an appeal to her that does not enter into her husband's scheme of existence, we cannot say with any certainty, but the fact remains that "retiring" to the city is less fatal to the woman than to the man.

If you are thinking of disposing of your farm, think again. If it must be done, secure some job in the place you go to, which will occupy your spare hours, and particularly start right away on a back-yard garden of vegetables and a front-yard flower-garden, so that you may not be altogether divorced from the soil.

Ice Houses Increase Comfort

LAST winter was so unusually mild that not a few persons found themselves short of ice before the end of the summer. When this happens, a lot of inconvenience follows on hot days. Ask any housekeeper what luxury (if such it may be called) she most longs for when the meat spoils, the milk sours and the butter faints on the platter. She will tell you she wants some way of keeping food fresh, more than any other one thing.

You need hardly be told that there's waste in letting food spoil. A good supply of ice is a great economy. And then, too, it promotes health. Fresh, cool drinks, ice cream, firm butter, crisp vegetables, are all so much better for us than wilted vegetables and lukewarm drinks. Is there a baby in your home? You'll save the little dear a lot of worries if you can get ice whenever wanted.

Does the warm weather affect your usually sweet disposition, or perhaps that of your good husband? People often grow a bit "edgy" when the mercury forgets to stop climbing, when sleep is less sound and when domestic duties become perspiry tasks instead of interesting occupation. There'll be more cheerfulness and peace in your household if there's ice to cool the hot tempers and refresh the tired nerves.

Ice houses of concrete may be constructed at moderate cost, and will last a life time. Ice houses of wood are very satisfactory when properly constructed. In this nipping weather it may make you shiver even to think of ice, but we know that summer follows winter and heat follows cold, and only in the bitter weather can provision be made for the sultry times ahead.

Work for Good Roads

ROAD work is scarcely woman's work, but a lot of push can be given by women to the good roads movement. It is too late to do much for your neighborhood roads this winter, though the constant use of the road drag will, as a rule, keep dirt roads passable, but a good-roads propaganda can be worked up in the bad months as well, or perhaps better, than in the good.

One thing you might do for the good roads cause is to make notes of the inconveniences and losses resulting through the winter season from bad roads. Use them as arguments in the community club, or other neighborhood meetings, against what are aptly called Bolshevik roads. Such roads are a menace to the prosperity of any community. They make residence there so undesirable that, where the bolshevik road prevails, there is little chance of attracting worth-while settlers.

It would be exceedingly interesting if the members of any neighborhood club would, at this season, agree to jot down the mishaps resulting from bad roads through the winter season and then—say at the May meeting—have these jottings read.

How many disappointments would be recorded! The pleasant meetings that had been planned and that could not be carried out because of intervening mud-holes. The time lost in hauling farm produce a few miles to market, or the produce itself lost because the market could not be reached. The monotonous diet forced upon the mud-bound farm because of the difficulty of getting to the source of fresh supplies

With the memory of such injuries fresh upon them, there might be a fairly snappy good-roads campaign carried out next summer.

For Your Boy— at College or on the Farm

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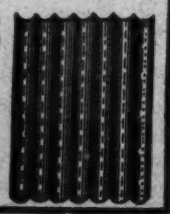

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BEAUTIFYING THE HOME & GROUNDS

By Mary Lee Adams

One of the encouraging signs of the times is the amount of interest shown in the beautifying the farm home grounds with ornamental trees and shrubs. In this department it is our aim to help readers plan the arrangement of their ornamental plantings in the most tasteful manner. To our subscribers we will send a useful book on "Landscape Gardening," free upon request. To secure a free, individual planting plan, send us a rough sketch of your home grounds showing location of buildings. State size of area to be planted and what amount you contemplate spending on shrubs, etc. Address Mary Lee Adams, AMERICAN FRUIT GROWER, Chicago, Ill.

NEXT SUMMER'S GARDEN

Only yesterday it was Christmas and already the New Year is speeding toward spring. In many localities March is the first spring month, not only on the calendar, but practically in the garden, and everywhere the time grows short for the completion of plans and for the construction of such landscape features as are needed to make the garden most attractive next summer.

It is impossible even to guess at the individual problems of each one, but it is easy to know that the problems are there for all, and can in most cases be solved. Never accept defeat at the hands of nature. If she absolutely refuses to conform to your ideal, then try to find out what hers may be in such circumstances of climate and soil as exist where you live. "All places that the eye of heaven visits, are to the wise man ports and happy havens," and by taking nature into partnership you can succeed in creating beauty in your home surroundings.

Use Discretion in Planting

Not a few of us are doubtful as to what plants are best for certain purposes and in certain climates, and time is wasted trying to induce things to grow that simply will not do it outside of their own chosen localities. Fortunately it is not necessary to put our garden plants to so severe a test as has been required to decide what mushrooms are edible. Says one uncompromising authority, "The test of a silver spoon is altogether unreliable. There is but one infallible method. Cook and eat the newly discovered variety of mushroom. If you survive, you may know it is at least not deadly."

Experience is indeed the surest guide but we need not rely solely upon our own. Unless we have abundant space and opportunity for experimental planting, it is safest to follow where others have led. If you have set your heart upon growing some personal favorite that does not appear in your neighbor's garden or in the fields and woods near at hand, you would do well to find out why this is so and what precautions, if any, may be taken to induce the rare plant to flourish.

Welcome the Birds.

The birds will soon be coming back. Are you prepared to give them hospitable welcome? You know how thirsty you get on the first warm day. The little feathered friends are not less so. Have the bird bath or fountain in readiness. There are many suitable spots for one near most country homes.

A very pretty placing for it would be in the center of a small square garden. If you have but a limited space to devote to flowers, try what a delightful effect can be produced by making a circular composition within a small square. It may be to one side of the dwelling and inclosed by means of a wall, fence or hedge. Probably you would wish an intersecting path running straight through the square in each direction until checked by the central circle. Turf or stepping stones laid in grass would be prettiest for this path, but red gravel or any nicely colored pebbles would look well.

These paths naturally break the square into four beds bordering the circle. In such a confined area, they should be very full of bloom throughout the season, with tall shrubs or perennials set against the inclosing walls and gradually facing down the planting to the level of the turf, until the lowest plants are supplemented with some good ground cover.

A sense of proportion must decide the relative sizes of the square and the circle within it. This circle may be treated in various ways. The entire center may be simply of close, smooth turf with the circle defined by the edge of the bordering flower beds, or you may prefer a path around it and a profusion of bright flowers filling it. The encircling path must by all means be of the same material as the straight ones, if you have used these, and whatever treatment you use, don't spoil your center piece by putting in it anything massive or clumpy.

Try here the slender shaft and airy basin of a graceful bird bath or, if you can get the water pressure, let the sparkling jet of a little fountain be the pivot on which the charm of the design hinges. Can't you imagine how pretty such a bit of a garden could be made with smallest demand upon time, space and care?

Change of Level Attractive

An idea that may be used in a larger and more pretentious landscape design, is the change of level. It's hard to explain why one experiences an odd satisfaction in going over some old, old house in which you take a step down here and two or three steps up there. It is the same in a garden. If your land slopes, you may use the fall of the ground to advantage.

Fine effects can be gained by dropping the flower garden below the terrace upon which the house stands, and still keeping it raised above the lawn. This, of course, necessitates the work of grading, but those who can afford it and whose site slopes suitably, will be rewarded by a very picturesque effect and one rather out of the ordinary.

Even the use of two levels gives refreshing variety, as when the flower beds are sunken below the breadth of lawn immediately surrounding the dwelling, or when they are skillfully incorporated with the top of the terrace that drops to the lawn below.

Keep the Design Harmonious

So far no artist has introduced jazz themes into landscape gardening, though the futurists came perilously near to it in painting. The undeniable sprightliness of jazz music, which is its only claim to popularity, would be lost in any art so static as landscaping. The freakish and funny have no place therein. Old-fashioned, oddly clipped box hedges come as near to being funny as one may venture, and the inherent formality and dignity of box save the day for the box enthusiast.

It may be monotonous to harp upon harmony in one's surroundings, yet without it there is no pleasure to the eye. If your surroundings and your dwelling don't agree, you are bound to find some way of bringing them together. This

can almost always be done when the owner has (or employs someone who has) ingenuity and some artistic sense and training.

A good example of this was the case of a highly civilized colonial mansion set on a gentle hill in the midst of rough, stoney fields. A few good trees near the house offered the only apparent hope of unifying the picture. But was the purchaser discouraged? By no means. A sufficiently large enclosure was designed of rough stone walls, white palings and posts. This savored both of the fields and the flower garden, and within it was planned a picturesque forecourt on three levels, leading to the dwelling.

One stepped through the front gateway onto a smooth grassy lawn, the easiest possible transition from the rough, grassy field outside. From this one progressed up a few stone steps sunk in a low bank of turf, and there were the flowers, cultivated, yet gay and natural. Passing through their welcome and up some more steps, the formal terrace was gained upon which stood the colonial house with suitable shrubbery and planting close about it. There was no sense of discord either in coming from the fields up to the dwelling or in looking out from the house over the terrace, garden and fields.

SULPHUR FERTILIZERS

Within the last decade it has been pretty well established that nitrogen deficiency often limits the production of orchards. Applications of Chili saltpeter will commonly raise the vigor of old, devitalized orchards so they are productive and profitable. It also is pretty well established that much of the nitrogen can be supplied by growing leguminous cover crops in the orchard and working it into the soil by cultivation.

In some respects the farmers of 100 years ago had a better understanding of the conditions favoring the growth of legumes than we now have. At that time two ground rock fertilizers in addition to manure were in very common use: marls and gypsum. The marls are mainly lime carbonate or limestone, while the gypsum is mainly lime sulphate.

But we know one thing now about the growth of legumes that was not known then. We know that the proper strain of bacterium must be in the soil to produce nitrogen fixing tubercles, and that these organisms frequently are absent from soils. The inoculation is so important that practically every state agricultural college and experiment station furnishes the proper organisms for inoculating legumes.

Two deficiencies that must often be supplied for the growing of leguminous crops are now to be generally known. These are inoculation and liming. There is at least one more that we ought to have in mind, and that is the lack of a sufficient supply of sulphur. Because this factor is now commonly overlooked, we will give it main attention in this paper. One hundred years ago gypsum or land plaster was considered almost indispensable for the growth of clovers. It was often asserted then that you could get a good crop of clover on any likely agricultural land by the use of gypsum at the rate of 200 to 400 pounds to the acre. While this often proved to be the case it also sometimes failed. In these cases of failure perhaps the soil needed liming or some other unknown factor was lacking.

Results that are now being obtained in Oregon and Washington by the use of sulphur fertilizers on leguminous crops are very similar to the results obtained in the old days when the use of land plaster was in vogue in eastern United States and England. Bulletin number 163 issued by the Oregon Experiment Station and dealing with the sulphur requirements of crops is a signal contribution to agricultural literature and fully refuted the old erroneous dictum, prevalent in present soil texts, that soils bear an abundance of sulphur for all crop needs.

This bulletin shows that in many Oregon soils sulphur fertilizers give enormous increases in the yield of alfalfa. The tonnage increase in yields due to the use of these fertilizers often amounts to 105 per cent. Besides this, there is a material increase in the percentage of nitrogen and protein in the crop. This means a better quality of feed and a greater fertilizer value of each ton produced.

Oregon, as well as Wisconsin, has found that gypsum increases enormously the extent of the root system of legumes as well as the number of nodules on the roots. This enables the plant to feed on a much greater volume of soil. It also insures the fixation of much more nitrogen.

In most of the fertilizer experiments with orchards, phosphorus and potash give relatively little returns while nitrogen generally gives good returns. If only sulphur is needed for the growth of alfalfa or other leguminous cover crop there is no need of adding either phosphorus or potash. The cover crop will be worked in rather than be removed so there will be no removal of either phosphorus or potash by the cover crop. It is different with the sulphur, for it leaches out of the soil very rapidly and frequent additions may be necessary to replace that due to leaching.

The main factor in delaying a clear explanation of the fertilizer value of gypsum was the long standing misconception of the importance of sulphur on crop growth. This misconception grew out of Wolff's long-used and erroneous method of determining the sulphur content of crops. The new, accurate methods of analysis are rapidly shifting the question of sulphur fertilizers from one not supposed to deserve special attention, to one of the most serious of our fertilizer problems.

If the land is in urgent need of sulphur for producing maximum yields of alfalfa, clover or other leguminous cover crop, it is very easily and cheaply determined by sowing a few strips of gypsum or other sulphur fertilizer across the field. Under these circumstances the response is remarkable. A friend of mine who saw the Oregon experiments said he had seen many demonstrations with fertilizers, but he had never before seen such striking returns as were obtained in this case with sulphur fertilizers.

PLANTING TREES BY THE ROADSIDE

There is a newly discovered benefit in tree planting by the roadside. It has been learned of late that the shade or partial shade of roadside trees is a great aid in keeping the pavement in prime condition. The authorities tell us that during the hot days of summer improved roadbeds are injured by the direct rays of the sun and that the partial shade of trees planted by the roadside enables the cement or other pavements to stand much longer unimpaired. Roadside trees will far more than pay for themselves by assisting in preserving good roads. Then there is the beauty of shade trees, and if fruit trees are planted think of the abundance of peach, plum, pear, cherry, apple and other fruit trees growing by the roadside which in the aggregate would amount to millions of dollars if generally planted through the fruit growing sections of the United States.

The German people are remarkably thrifty. Long ago they adopted the practice of planting fruit trees by the roadside and in this manner secured much revenue. I once passed through the Black Forest region of Germany and noticed the plum trees growing on either side of the highway.

SYRUP FROM WINE GRAPES

Wine grape growers are greatly interested in methods of manufacturing grape syrup from the product of their vineyards, for they regard this syrup as the best practical outlet for getting returns from their crops under national prohibition. Even if it be used for making wine, the syrup has great advantages over raisins used for the same purpose. It is not nearly so troublesome to handle and both color and flavor are superior to what can be attained in dried wine grapes.

Soda fountains find many uses for the syrup, which is red and of high flavor. A bulletin put out by the University of California, described several methods of manufacturing syrup from wine grapes, but the process has already been greatly improved. Doubtless a nearer approach to perfection is still ahead if the wine grape growers persist in seeking to develop the best possible product from their crops.

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Fig. 1 shows root system of alfalfa fertilized with GYPSUM. Fig. 2 shows root system without GYPSUM. From Bull-tin 163 of Oregon Ag. Experiment Station

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Fruit Growing in Australasia

(*Continued from page 22*)

When the engine of a four-ton motor lorry smashed her cylinders, the tractor was sent out to haul in the disabled lorry, which was successfully done, though the tractor had to pull the lorry up a steep incline, 500 feet in two miles.

Mr. Sim told me the other day that tractors for orchards had come to stay, and that their use will become quite general in the near future.

Chatting over this subject with one of our biggest Australian plow makers, he said that as levers can be operated by the driver of the tractor, Australian-made plows could be altered to suit this new method. The tractor would not be harmed if going over ground where stumps had been left in, as by means of a wooden peg a strain would be put on the engine when encountering a stump which would either stop the engine or the wooden peg would break and no harm would be done. Our friend expressed the opinion that the tractors would do away with horses on orchards, except where the orchardist was in a small way and needed one horse and a single furrow plow to cut out the strips. The Fordson tractor is being thoroughly tried out on the Soldier-settlement at Young, New South Wales.

A Low-Down Tractor Discing an Australian Orchard.

The Coming Crop

There has been a wonderful setting of nearly all fruits throughout Australia and New Zealand. New season's cherries, strawberries, gooseberries are now on the market; these will be followed by plums, peaches and apricots and later by pears and apples. Throughout all the Australian states and New Zealand there will be a heavy crop of apples, and much fruit will need to be exported. The crop of pears ranges from medium to light. Peaches and apricots are showing up heavily. Jam and canning factories absorb the bulk of pears, peaches, apricots and small fruits. Last season's cold stored Australian apples are still on the market and are being sold at prices from four to five dollars per bushel wholesale, and from 9d (18 cents) per pound in the shops.

There were no importations of American apples last season. Their presence would have relieved the shortage of Australian apples on the market. There is no question that in the off season it would be the advantage for American apples to be received here; the public would gladly buy same because of the excellent packing, good appearance and general quality of the American fruit. Similarly, in the American off season Australian apples should find a welcome place amongst the American public.

The Sugar Position

There is a world's shortage of sugar at the present time. Owing to the commonwealth government having purchased the entire output of the Queensland cane fields and factories, sugar in Australia is £27:7:6d per ton, which is about half the world's parity at present, which gives Australian manufacturers an advantage in the export markets. Jams and canned fruits are bringing a higher price in England than in Australia. This condition, however, is quite abnormal, and fruit growers who are looking ahead are apprehensive of future government control of the sugar business. Prior to the war, manufacturers were allowed to import sugar on paying a duty of £6 per ton, this duty being refunded when the sugar was re-exported in the form of jam and canned fruits. Till about half way through the war sugar in Australia was considerably above the world's parity, and but for huge war contracts, there would have been serious gluts of jam and canned fruits as the ordinary export market was seriously upset. Fruit growers protested to the Australian Prime Minister and the Minister for Trade and Customs against the price of sugar.

Government control of sugar has led to inevitable delays and humbug, and it is hoped that when the world's sugar market is normal, sugar in Australia will be free again. Just before the armistice was signed there were vast quantities of sugar in Java, which is only two days' sail from the north of Australia. Fruit growers requested the government either to buy huge quantities or to lift the order prohibiting the import of sugar; but nothing was done. The statement made by the government officials that the shipping was not available was knocked out by the Java people quoting us c. i. f. Melbourne and Sydney. As a matter of fact, sugar was available in Java at any old price—£5:0:0 per ton.

Fruit Graders

There are several fruit graders on the market, but they are not up to the standard of the American grader. In Australia and New Zealand, packing sheds are being organized largely in fruit-growing districts, and thus the larger type of American grader will be required for the sheds.

Advertising Dried Fruits

The biggest fruit advertising effort so far conducted was that of the Australian Dried Fruits Association last season. The dried fruit growers taxed themselves to the extent of one farthing (half a cent) per pound, and the sum of £15,000 ($75,000) was thus available. There was a public competition and the name "Sun Raysed" was chosen. Various advertising stunts were indulged in with the result that good work was accomplished and sales largely increased. The energetic director of the publicity campaign of the Dried Fruits Association, Mr. C. J. DeGaris, stated recently:

"Prior to the publicity campaign (October, 1918) the figures for the commonwealth consumption of vine fruit (currants, Sultanas and Lexias) were:

1914 ..... 8,252 tons
1917 ..... 8,399 tons

An increase of 147 tons only. Since then the 1918 figures show 9,457 tons—an increase of 1,058 tons on the previous best. For 1919 season it is yet too early to say, but seeing that in spite of the recent shipping strike, many merchants state that they will be out of stock by Christmas and others state they will barely have enough to see them through till the new season, it is certain that the 1919 figures will be considerably above 1918—probably 10,400 tons—despite the 15-weeks shipping interruption.

The Pomological Committee of Australia holds its sixth Annual Conference at Hobart, Tasmania, on April 14 to 17, 1920. This is in conjunction with the big Australasian fruit show to be held at Hobart at the same time at which show £500 will be distributed in prizes.

Afgco Cook Book

Orange Pudding

2 tablespoons gelatine
1 cup orange pulp and juice
½ cup cold water
Juice of ½ lemon
½ cup sugar
½ pint whipped cream
Cherries

Soak gelatine in cold water for five minutes. Dissolve over boiling water. Add orange juice, lemon juice and sugar. Beat well. When it begins to thicken add whipped cream, mould and chill. Garnish with cherries or green leaves from any plant.

Squash Waffles

2 cups flour
½ teaspoon salt
1 teaspoon baking powder
½ cup cooked mashed squash
2 egg yolks beaten
1 tablespoon molasses
3 tablespoons melted oleo
⅞ cup milk
2 egg whites beaten stiff

Sift flour, salt, baking powder together. Add other ingredients, mixing well, and fold egg whites in last. Bake in hot waffle irons.

Brown Beef Stew

4 tablespoons flour
2 tablespoons suet
1 quart stock
2 pounds beef
1 teaspoon salt
1 teaspoon kitchen bouquet
1 onion
1 bay leaf
1 carrot
¼ teaspoon pepper

Cut beef in one inch squares. Roll in two tablespoons of flour. Melt suet in kettle, remove cracklings and put in meat. Shake until slightly brown. Draw meat to one side of pan and add flour to fat. When smooth add stock and seasonings. Cover and cook slowly until meat is tender.

Chicken Pie

1 chicken
1 cup boiling water
1 pint milk
2 tablespoons butter
2 tablespoons flour
Salt, Paprika

Cook chicken in boiling water. When done remove bones and cut meat in small pieces. Add to gravy, milk and butter blend with flour. Season. Cover with rich biscuit crust. Bake in hot oven.

Casserole of Vegetables

1 can peas
½ cup sliced onion
1 cup diced celery
2 cups string beans (canned)
1 cup beets (canned)
½ cup ham drippings

Drain vegetables. Arrange in greased casserole in layers. Pour melted drippings over top. Bake until vegetables are thoroughly heated.

Escalloped Oysters and Rice

1 cup rice
1 pint oysters
2 eggs (well beaten)
2 tablespoons butter
1 cup hot milk
¾ cup cracker crumbs
Salt, pepper

Use liquor from oysters and add enough boiling water to make four cupfuls. Cook rice in oyster water until tender. Drain rice, add eggs and butter. Arrange rice and oysters in alternate layers in a buttered dish. Season. Cover with layer of cracker crumbs. Dot over with small pieces of butter. Pour hot milk over. Bake until brown on top. Serve hot.

Spice Cookies

½ cup shortening
2 cups sugar
4 eggs
1 tablespoon cinnamon
¼ teaspoon cloves
½ oz. chopped citron
1 nutmeg grated
1½ tablespoons orange peel (chopped fine)
1½ tablespoons lemon peel (chopped fine)
1 teaspoon baking powder
1 pound flour

Cream shortening and sugar. Add well beaten eggs. Add other ingredients. Mix well, roll out and cut. Moderate oven.

Potato Biscuit

1 cup fresh mashed potato
1 cup white flour
½ teaspoon salt
2 tablespoons lard
4 teaspoons baking powder
⅓ cup milk

Mix potatoes and lard. Mix flour, salt and baking powder. Combine mixtures. Add milk. Roll to one-half inch in thickness and cut with biscuit cutter.

Cream Pie

3 cups milk
2 eggs beaten
4 tablespoons sugar
¼ teaspoon salt
1 tablespoon cornstarch
1 teaspoon vanilla
1 baked pastry shell

Moisten cornstarch with a little milk, blend smooth. Beat eggs well. Add sugar, milk and cornstarch. Put in top of double boiler. As it cooks beat it often with an egg beater. When thick remove from fire, cool, add vanilla. Fill pastry shell. If desired an inch of whipped cream may be spread over this just before serving it.

Pickled Beets

6 medium sized beets
6 large slices of onion
2½ cups sugar
6 tablespoons grated horseradish
24 cloves
Vinegar

Boil, skin and cut beets in slices crosswise. Arrange in stone or glass jar with other ingredients. Cover with cider vinegar (not too strong). Let stand twenty-four hours before using. Will not keep long.

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No. 9538. Ladies' One-Piece Dress—Cut in sizes 36, 38, 40, 42 and 44 inches bust measure.

No. 9543. Ladies' Apron—Cut in sizes 36, 40 and 44 inches bust measure.

No. 9542. Ladies' Waist—Cut in sizes 36, 38, 40, 42 and 44 inches bust measure.

No. 9540. Girls' Dress—Cut in sizes 6, 8, 10, 12 and 14 years.

No. 9517. Girls' and Child's Coat—Cut in sizes 1, 2, 4, 6, 8, 10, 12 and 14 years.

No. 9523. Ladies' Circular Skirt—Cut in sizes 26, 28, 30, 32, 34 and 36 inches waist measure.

No. 9519. Ladies' and Misses' Two-Piece Skirt—Cut in sizes 16, 18 years and 26, 28 and 30 inches waist measure.

No. 9544. Ladies' One-Piece House-dress—Cut in sizes 36, 38, 40 and 42 inches bust measure.

No. 9533. Boys' Suit—Cut in sizes 2, 4 and 6 years.

No. 9524. Girls' and Child's Coat—Cut in sizes 2, 4, 6, 8, 10, 12 and 14 years.

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The Housekeepers' Exchange

Soaking corn meal an hour before using, make the cornbread lighter.
H. M. L.

An excellent floor oil and stain can be made by melting one cake of paraffin in one gallon of kerosene. If any special shade is desired, stain in a powdered form may be added. Apply to the floor while hot. C. C. P., New Mexico.

To drive a nail through a plaster wall, dip it in hot water—this will prevent the wall from breaking away.
H. R., Minn.

A lump of sugar put into a quart of olive oil will keep it from getting rancid.
L. A., Minn.

To remove the dye from flour sacks, dampen and hang them on the line to freeze before washing them.
O. J. M., Wis.

A bicycle pump will clean a sewing machine better than any amount of rubbing with a cloth. It blows out all the little particles of thread and dirt otherwise impossible to get at.
C. K. T., Kansas.

When boiling mush add enough milk to color water and it will brown quickly when fried. V. H. V., Ohio.

Sharpen the knives of the food chopper by grinding through it a piece of any scouring soap. L. R., Kansas.

When covering my ironing board, I padded one side with several thicknesses of turkish toweling, always having a ready surface for ironing a garment having embroidery or buttons on it.
S. B., N. Y.

At a child's party, at each plate was a small cake which had been covered with white frosting and the initials in colored frosting, put on with a small brush. Inserted in each cake was a very tiny lighted candle. This delighted the kiddies. L. R. T., Michigan.

A flower pot even if too cracked for potting plants makes a convenient receptacle for the evasive ball of twine. Pass the loose end of twine through the hole in the bottom of the pot and invert on the shelf or some handy place.
J. M. N., Colo.

Instead of peeling and boiling pumpkin for pies, try baking it in the oven and scraping it out of the shell.
D. E. N., Ohio.

A teaspoonful of salt peter added to one half gallon of water is excellent for making house plants such as ferns, cactus, etc., grow. S. A. B., Okla.

A discarded soft red felt hat made a pair of lovely "Comfy slippers," by patterning the uppers after an old pair and sewing to a pair of lambs wool soles. A few stitches done in heavy black embroidery silk and black ribbon rosettes furnished the decoration.
T. C. B., Mass.

White table oilcloth can be used for the baby's crib. It can be cleaned with a damp cloth. When soiled it can be burned and replaced at a small expense.
R. A. W., Wisconsin.

In making pumpkin pies in winter use a tablespoonful of flour for every egg left out. A. M., Mich.

Adding a tablespoonful of peroxide to the water in which white silk is washed as well as to the last rinsing water will keep it from turning yellow.
G. N., Calif.

To save ironing the every day towels and the dish towels, after rinsing, fold lengthwise, run through the wringer, unfold and hang up to dry.
E. B., Indiana.

Instead of giving my small children bread and butter, I make it into sandwich form and avoid "butter side down" accidents. It also saves greasy fingers, faces and aprons. E. E. H., Nebr.

Before polishing your stove moisten the hands then rub well with soap especially around the nails. Washing the hands afterwards will take all the blacking off with the soap. C. W., Okla.

The Harmony Brewery plant at Ambridge, Pa., will be converted into a vinegar factory by the J. H. Heintz Company of Pittsburg, who recently paid $65,000 for the property.

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HEALTH THROUGH HOUSEWORK

How many of us by being merely busy with our homes and babies get the same kind of exercise we used to enjoy playing tennis and golf. Perhaps the tennis court and the golf links are now out of the question, but the chance to get the same kind of exercise that will keep our faces young and our minds alert will be found right at home if we only know how, and knowing how consists merely in moving the way nature intends that we should.

Often housework exhausts the worker rather than builds up a stronger and more efficient woman, because she does not know how to use properly her muscles; overworking the small muscles of the arms and legs and neglecting the large muscles of the thigh, abdomen and back.

All of us have at one time or another, remarked of a person along in years, that they seem so "muscularly fit." It is the exercising of these large muscles that is the secret. Nature intends us to move rhythmically. There is nothing more beneficial to the nervous system than rhythm, which means greater poise of mind, nerve and muscle. It means work done with greater pleasure and less fatigue—in short, it means recreation through work. Why does the soldier always march to the drum or marching song? Because it stimulates the lagger. Why not apply this principle to housework. Scrubbing is a splendid chance to exercise the deep muscles of waist, abdomen and back, muscles sadly neglected and which directly affect vitality. Let the whole body swing easily and freely into the rhythm of the overlapping circles made with the brush. When dusting, let the body freely bend, turn waist and stretch, adjusting the muscles to each new article with keen delight and see if it does not do the liver as much good as a game of golf. When sweeping, stand upright letting the body swing with the broom, rather than stooping over; this gives the heart and lungs the freedom for greater activity. No serve in tennis can give a better stretch and swing than can be gotten from dusting down walls. Wiping down walls and washing windows if done properly, will give the deep muscles of the back just the needed exercise. Use an arm motion, bringing into action the large muscles of the upper shoulder and the back. This keeps the back flat, prevents round shoulders and relieves any crowded condition of heart and lungs. Reaching upward as for articles stored on high shelves, hanging pictures, raising windows, etc., may be made a restful exercise; never strain—take time to get a chair or step ladder. Elongate the body to its greatest height by rising on the toes and stretching upwards with the arms and body, having the head erect and taking a good breath, but remember, do not strain! Stooping reduces muscles or fatigue in that the exertion is distributed over the entire body and no special demand is made on any particular muscle.

Working Clothes

Much consideration may be given the clothes worn in working. They should allow absolute bodily freedom—a loose waist line and a short skirt and sleeves. Much fatigue comes from pressure on the nerves of the foot. To attempt to put the finishing touches on stretched out pumps or worn out dress shoes, is poor economy. Wear common sense heels and a comfortably wide toe. Tight clothing and run down heels often prevent a correct standing position.

Such things as sinks, washtubs, ironing boards, etc., should be so adjusted that the equilibrium of the body can be maintained and stooping unnecessary. If the sink is too low and cannot be raised, get around the difficulty by placing a box under the dishpan. Tables, ironing boards, etc., demanding the use of forearm muscles to do work must be measured just high enough to get easy leverage from the elbow and not from the shoulder. Thirty to thirty-three inches is the range suited to most women; thirty for the five foot worker and thirty-three for the woman five feet seven inches.

THE PARABLE OF THE DISCONTENTED APPLE BLOSSOM

By Mrs. Vaughan

Once upon a time, there grew in an orchard, a large apple tree. During the month of May, it was laden with sweet blossoms whose beauty could be seen afar off and whose perfume was borne everywhere upon the breeze.

Among this host of sweet blossoms grew one which was lovelier, fairer and more sweetly perfumed than all the others. She was wooed by the bees and kissed by the sun. At night the stars looked down upon her loveliness and twinkled in admiration; and, in the morning, the dew-drops nestled around her heart.

As the days grew warmer and the springtime passed into summer, myriads of fair petals fell to the ground, until only a few were left upon the tree. Among the few blossoms that remained, was this radiant queen of them all. Her petals remained longer than any of the others; but, by and by, they too began to fall to the ground.

Instead of gracefully accepting the inevitable, she fretted at the loss of her lovely petals.

All during the summer, her companions drank in the rain and sunshine and grew into healthy, round, green apples, while she remained shrunken and undeveloped upon her stem.

When the autumn came and the hills looked blue and smoky in the distance, the leaves put on their holiday colors, and the apples mellowed in the sunshine and changed from green into red and gold. And then the harvester came. He carefully gathered this beautiful store of ripened fruit. When he came to the little, shrunken, green apple, all that now remained of the beautiful queen of the blossoms, he cast it upon the ground to die and decay.

The apple blossoms were women, and the queen was one of those more blessed with beauty than many others. She murmered at the passing of the years and the loss of her charms.

Instead of enriching her life with noble deeds and developing the beauty of her soul, she so fretted at the loss of outward charms that her soul became as shriveled and withered as her face.

O, woman, the flight of time is inexorable. Youth comes but once in a life-time. It is radiant with hope and promise, but old age may be made beautiful, and golden, and glorious, just as the sunset may be more beautiful than the dawn.

Live so that when the shadows of the evening of life steal upon you, you may welcome them and be ready to go to rest, even as the little child sleeps upon its mother's bosom.

AUSTRALIAN FRUIT NOTES

The Journal of the Department of Agriculture, Victoria, Australia, mentions a cold-storage complaint of apples, "Sleepiness," which is new to us, at least under that name. It says: "Concerning Sleepiness" it may be mentioned that, as this developes there are no outward signs to indicate that such an interior change in the apple is taking place. The presence of sleepiness may be detected, however, as the affected portion being rather soft yields to gentle pressure. If the skin of this part be broken during the first stage of the disease, the flesh will be brown and found to contain excessive moisture. In the later stage the moisture disappears and the flesh becomes spongy."

Health and Profit in Berries

By Mrs. Julia Walt Covey, Michigan

I DO NOT suppose that the readers of this journal will find anything very wonderful in my experience with strawberries, but I'm going to tell the story just the same. Nine years ago my physician informed me in a very pointed manner that, if I desired to continue my existence on earth for another twelve months, I must get more exercise out of doors in the open air. He recommended chickens as a means of employing my time and muscles, so out where ozone was more plentiful and health was oozing out of every corner I turned. My husband set aside 12 acres that had a slight southern slope, with a spring brook running across the south end. On this we built large hen houses and a number of small colony houses. I then stocked up with pure bred fowls, and made a success of the venture.

The spring brook served as a fine watering place for my fowls, but as I made different arrangement about watering them, I fenced off a plot in the southeast corner of the lot, taking in the larger part of the spring brook. This plot was 20 rods long along the brook, and four rods wide. Here I began my experiments with everbearing strawberries.

Planting and Fertilizing

In September of 1914 I had the plot plowed 12 inches deep, disced and rolled. There had been colony houses on the plot for several years, and it was completely denuded of all vegetation. I then set out my strawberry plants in rows 36 inches apart. This gave me 21 rows, allowing for a margin on each side of the plot. The plants grew well on that rich, black, sandy loam, and in early November I had eight large loads of fine manure from the horse barn spread over the plot. This I raked off early the following spring, and found the plants all alive and vigorous. I had a five-toothed cultivator run through them, and 12 loads of droppings from the hen houses between the rows. At first I began picking the blossoms in order to make the vines more thrifty, but soon gave that up and let them grow.

In June I began picking ripe berries and continued to do so till the heavy frosts in late October killed blossoms and young berries. I kept no track of the amount gathered, nor did I keep track of the money I received from what I sold. I do know, however, that I put over $100 in the bank during the season.

The Second Season

That fall I followed the same plan as before, by having the plot covered with fine horse manure from the horse stables.

In the spring of 1916, I determined to keep an account with the strawberries and have a better knowledge of what I was doing. I never saw anything grow as luxuriantly as those plants. I again filled the rows between the plants with hen droppings, and kept the ground free from weeds with a hand cultivator.

I began picking early in June, and such berries I never saw before. From that time till they were again stopped by the October frosts I harvested 6,287 quarts of berries. I pack the berries in crates containing 16 boxes. Often have I counted the berries in a box where there were but fifteen berries to the quart. That would make the crate average a little better than 250 berries. Frequently did we fill a crate from 32 plants. Besides keeping enough to supply our two families I sold 388 crates, at an average price of $2.25 a crate. I put $846 in the bank after paying all the expenses of raising and harvesting the crop.

Third Season's Profit

In the fall of 1916 I allowed the runners to grow, and set them between the rows of old plants. I pursued the same measures, mulching the plants that fall, and the next spring I covered all I could between the rows with a cultivator before raking off the residue.

That year I gathered berries from early June till September 22, when they were killed by the early frost. I sold 496 crates, after providing enough for two families. I averaged $2.65 a crate. That year, after paying all the expenses of the crop, I banked $1,100.90.

In the fall of 1917 I cut out all the old plants, and left the thrifty new setting. Then I mulched with manure brought from the horse barn, and covered with liquid manure pumped from the cistern down at the cow stables. I had this mulching raked off a few days ago, and find the strongest young plants I ever saw. I feel sure that I shall harvest more than 650 crates from that plot this year.

Profit Put to Patriotic Use

I have kept my strawberry profits in such a manner that I can tell to a cent what they amount to. With them I purchased a $100 liberty bond, at the first call. Two hundred dollars at the second call; and $1,500 worth of bonds of the third loan. Every cent of the price paid for these bonds has been saved as profit on my strawberry patch and there are more to come.

Better still than anything I have said is the fact that I am perfectly healthy and would not exchange the work I am doing among my chickens and strawberries for any condition imaginable.

USES OF LEAVES

By F. H. Sweet, Virginia

Many persons make the mistake of having the leaves raked off their lawns in the fall, and either burned or carried away. Leaves are nature's blanket for the cold months. Not only do they protect the grass, but in rotting they return to the soil in large measure the strength which their growth took from it.

There are many practical uses for leaves, all of them profitable. They make excellent bedding for cattle, hogs and horses. They can often be used to advantage as a dry, clean litter on the floors of chicken-houses. They make good protection for the roots of rosebushes and other plants that stand out during winter. A strawberry bed covered with leaves is not only perfectly protected from the fatal "lifting" incident to a thaw, but is permanently enriched by an ideal mulch.

The best use of leaves is probably on a compost heap, or in a hogshead where they can be packed to insure early and thorough rotting, or in an excavation in the garden where their decay during the winter will produce leaf-mold, an excellent fertilizer for any kind of a plant in any kind of a garden. The value of woods earth has never been widely enough known; there are many intelligent gardeners who live within easy reach of it, and never take advantage of this supply of very valuable fertilizing material.

During the past few years a great deal has been written on the value to the soil of humus, which is simply moisture-holding matter, usually originating from decaying vegetation. Rotted leaves supply humus in abundance, and of the very best quality. It has been demonstrated that one hundred pounds of dry sand will absorb twenty-two pounds of water; that the same quantity of clay loam will absorb fifty-six pounds of water; and that one hundred pounds of leaf-mold will take up one hundred and ninety-six pounds of water. Leaf-mold soil is therefore nine times as good a holder of water as sand.

Strawberry fields in the Pasadena-Deepwater district, in southern Texas, have been practically wiped out by a combination of three unfavorable circumstances. Superabundance of rain, high cost of labor and excitement over oil, which led to neglect of plantings, were too much for the industry in this section. On the other hand, there are districts in Texas from which come reports of largely increased strawberry acreage.

The Department of Agriculture, Harrisburg, Pa., brings out in General Bulletin 317, a list of registered dealers in nursery stock. It would put a crimp into the selling of nursery stock by unreliable agents, if each state would do likewise and if every grower would acquaint himself with the list and avoid being cheated.

Fight Film

To Save Your Teeth

All Statements Approved by High Dental Authorities

It is Film that Ruins Them

This is why brushed teeth discolor and decay. And why old methods of cleaning have proved so inadequate.

Your teeth are covered with a slimy film. It clings to them, enters crevices and stays. That film is the cause of most tooth troubles.

The tooth brush does not end it. The ordinary dentifrice does not dissolve it. So, month after month, that film remains and may do a ceaseless damage.

That film is what discolors — not the teeth. It is the basis of tartar. It holds food substance which ferments and forms acid. It holds the acid in contact with the teeth to cause decay.

Millions of germs breed in it. They, with tartar, are the chief cause of pyorrhea. Also of many other troubles.

Dental science, after years of searching, has found a way to combat that film. Able authorities have proved the method by many careful tests. And now, after years of proving, leading dentists all over America are urging its daily use.

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For home use this method is embodied in a dentifrice called Pepsodent. And a 10-Day Tube is sent without charge to anyone who asks.

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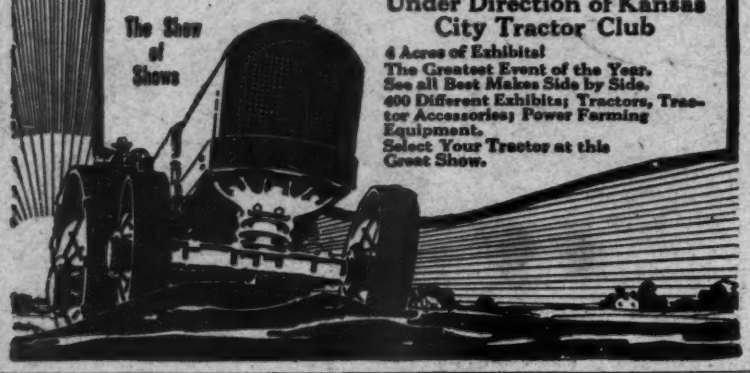

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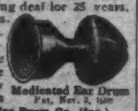

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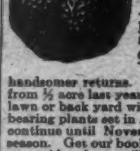

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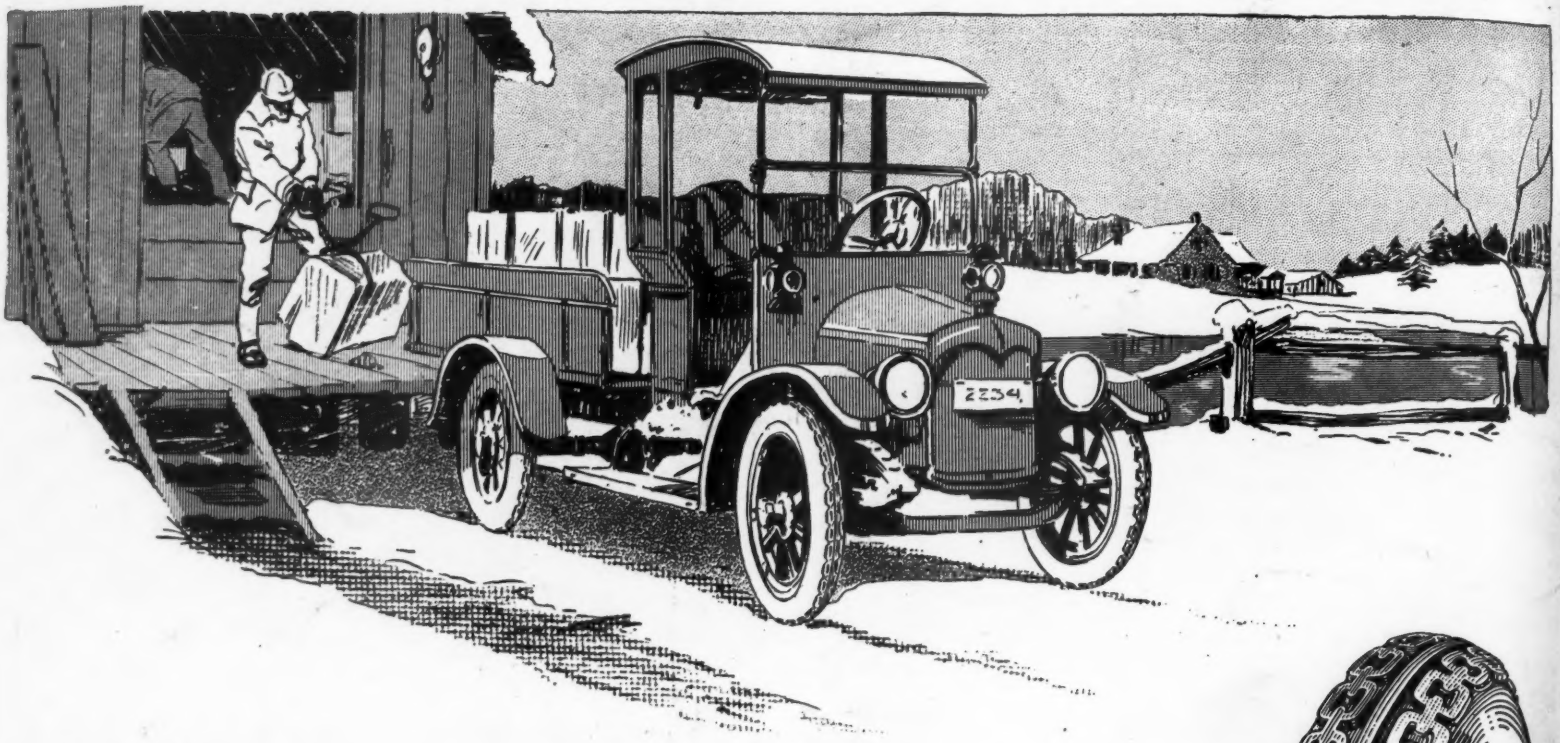

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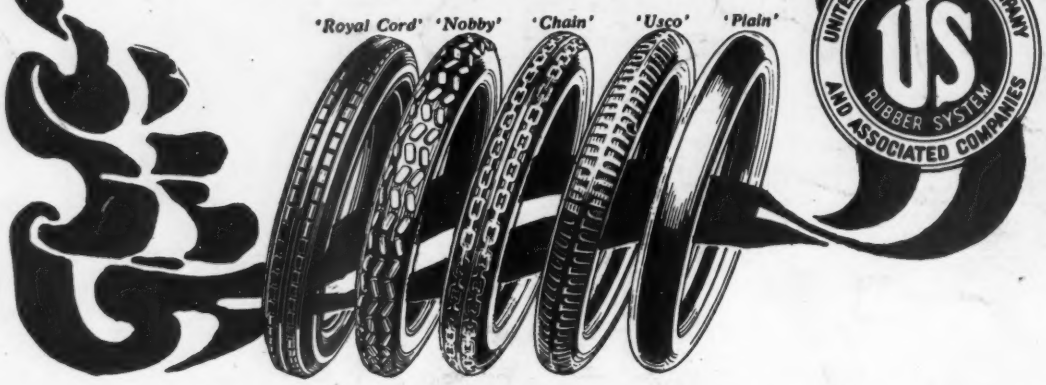
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